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ABSTRACT

The paper examines the problem of auditory figure ground confusion, usually indicated by distractibility, inability to follow directions, and/or inability to comprehend word meanings. A practicum was designed to teach kindergarten and first grade teachers to alleviate the auditory figure-ground disability. Author-produced cassette tapes emphasizing verbal mediation, stress on directions, and specific temporal and spatial concepts in a number of settings were used with 29 children. Pre- and post-tests indicated that 24 (82.8%) of the children met or exceeded the target goal. It was concluded that verbal mediation may be easily and quickly taught to young children, and that children who know how to mediate and comprehend basic words can overcome the auditory figure-ground disability, and may never require special help. Eight pages of references and bibliography are included. Numerous appendices provide questionnaires used with parents and teachers, lesson and activity schedules, management suggestions for teachers and a resource list for tests and materials. (CL)

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P R A C T I C

REPORT

Center for the
Advancement of Education
Ed.D. Program

Alleviating Auditory Figure-Ground Disability
in Kindergarten and First-Grade Children
Using Rehabilitative and Nonrehabilitative
Techniques

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**Alleviating Auditory Figure-Ground Disability
in Kindergarten and First-Grade Children
Using Rehabilitative and Nonrehabilitative Techniques**

by

Grace Frank

Cluster 12

**A Practicum Report Presented to the Ed.D. Program
in Early Childhood
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education**

NOVA UNIVERSITY

1984

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ABSTRACT

Alleviating Auditory Figure-Ground Disability in Kindergarten and First-Grade Children Using Rehabilitative and Nonrehabilitative techniques.

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Descriptors: Attention: Attention Deficit Disorders/ Attention Control/ Auditory Perception in Young Children/ Aural Learning: Language Acquisition/ Listening Comprehension/ Verbal Learning: Mediation Theory/ Distractibility and Inner Language.

This practicum addressed the problem of auditory figure-ground confusion usually indicated by distractibility, inability to follow directions, and/or inability to comprehend word meanings. As early learning depends upon listening comprehension, these children often manifest low vocabulary, lack of basic concepts, and poor time sequence. Previous auditory methods focused primarily on listening tasks even though children were found to be unable to form temporal concepts without verbal labels.

The writer's major goals were (a) to teach techniques to alleviate the auditory figure-ground disability and (b) that kindergarten and first-grade teachers would become the catalysts for this remediation. In addressing these goals, a practicum was designed to utilize author-produced cassette tapes emphasizing verbal mediation, stress on directions, and specific temporal and spatial concepts in a number of settings.

Standards of performance were met for all objectives. Mean auditory closure Time-Series Design graphs disclosed intervention produced a highly-significant change. Of the 29 children taking part in the practicum, 24 (82.8%) met or exceeded the target goal.

CHAPTER I

INTRODUCTION

The Community

Simi Valley is a relatively new community situated in Ventura County, California. The valley has an extensive history dating back to inhabitation by the Chumash Indians. Simi Valley has one of the finest polychromatic cave paintings in the entire world. As these Indians did not have a written language, their history and language would have been lost except for an ethnographer, John Peabody Harrington, who worked for the Smithsonian Institute of Washington, D.C., for 40 years. During that time, he interviewed the last of the Chumash and devised ways to record the language. Much of his work is just now being deciphered. Some writers contend the name, Simi, came from the Chumash word, "Shimiji," meaning little white clouds (Simi Valley Unified School District, [SVUSD], Note 1).

Spaniards regarded the Chumash as superior to other Indian tribes of California. In 1795, the earliest Spanish colonial land grant within Ventura and Santa Barbara Counties was given to members of the Pico family. El Rancho Simi was one of the largest land grants ever made, approximately 100,000 acres. Later when Mexico became independent from Spain, land was handed out rather freely (SVUSD, note 2).

The American Period began as Easteners started to look for farming land in California. Few Americans settled in Simi Valley until the 1880's. One of the first buildings was the hotel, built

in 1887. A group of doctors, called the California Mutual Benefit Company of Chicago, arranged to have 12 prefabricated houses sent west by rail. The plan did not materialize but two of these houses, known as "Colony Houses," are still in existence (SVUSD, Note 2, 3).

The town of Simi, or the Colony, was the first settlement in the valley. For a brief time, its postal address was known as Simiopolis, though it was soon shortened again to Simi. When the Southern Pacific Railroad built a tunnel through the Santa Susana Mountains in 1904, a depot was built and the town of Santa Susana came into being. Santa Susana rapidly became a center for agriculture and railroad activity. Eventually there were four small settlements or centers of activity in the valley (SVUSD, Note 2, 4).

The first "school" was merely lessons taught in French in the old Simi Adobe. Second school was an informal gathering of students under the trees in Sycamore Canyon which is Brandeis Camp today. This second school did not last long as the teacher was a tramp passing through. Simi School, the first "real" school, opened in 1890, just one year after the Colony was established. When Santa Susana materialized, a new one room school was built. In 1920, Simi had the first school bus in Ventura County to carry school children to the second Santa Susana School (SVUSD, Note 2, 4).

In all its history, Simi Valley was entirely dependent upon its agriculture. Cattle raising was always important on hillside ranches; while on the valley floor, various crops and orchards were planted. Earliest crop grown in Simi Valley was grain and it is still being grown. Sheep was raised from the earliest days of the Spaniards to

the present time. Simi Valley remained a peaceful little community through the 1920s and '30s. This area became the location for many movie and television productions which depicted life as it used to be. "The lone Ranger," "Fort Apache," and "Little House on the Prairie," as well as many other western type movie pictures were filmed here. Agriculture ended when it became too expensive to import water from outside the valley. Orange and apricot groves were cut down to make room for houses. In the 1940s, the first subdivisions were begun and the valley began to experience growing pains (SVUSD, Note 2, 5).

Character of the community changed from rural to big city or bedroom community. Population grew from 3,000 in 1940 to 70,754 in 1978. Population of 200,000 is forecast for 1990. The number of schools jumped from 2 in 1950 to 32 in 1978 (SVUSD, Note 2). Due to declining enrollment, the number of schools has decreased for the first time.



Early Schools...

Simi School opened in 1890, just one year after the Colony was established. This energetic community passed a bond issue and built the school within the year for \$3,000.

The first real school under county supervision was organized in the first year of the Simi Colony and was held in an empty Colony House until the brand new school was ready at the corner of Third Street and California Street in 1890.

(Courtesy of SVUSD, Note 2)

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Relatively isolated by surrounding hills, inhabitants commute to the neighboring areas, primarily San Fernando Valley, for employment, shopping, and entertainment. In October, 1960, the four little communities of the 1920s and '30s were formed into one city and incorporated under the name of Simi Valley. Inhabitants are now determined to bring large enterprise into the city. Shopping malls are beginning to be built on the vast, empty areas. Few industrial or major businesses are located in Simi Valley at the present time, but the city is attempting to attract them.

The Writer and the Work Setting

Simi Valley Unified School District (SVUSD) is the largest of the 21 school districts in Ventura County. Ventura County acts primarily as a liaison between the state government and school districts as each district has its own Superintendent and Board of Education (Smith, Note 6).

SVUSD has 27 schools, down from 31. There are 3 high schools, 5 junior high schools, and 19 elementary schools. One of these schools, Berylwood Elementary, is the site of this practicum. Located in the central part of Simi Valley, Berylwood has a projected enrollment of 562 students. The enrollment is as follows: (a) kindergarten, 73; (b) first-grade, 79; (c) second-grade, 63; (d) third-grade, 90; (e) fourth-grade, 43; (f) fifth-grade, 71; and (g) sixth-grade, 96 (Stevenson, Note 7). On campus will be 2 Severely Emotionally Disturbed (SED) classes, 2 Autistic classes, 2 Special Day classes (SDC - Educationally Handicapped), and 1 Resource

5

Specialist (R-STP) (Dinehart, Note 8).

This year four elementary schools were closed and enrollment was redistributed among the remaining 19 elementary schools. Arcane Elementary students, eligible for Chapter I funds and additional resources, are now to be bused onto Berylwood campus (Eisenberg, Note 9). Previously, Berylwood housed the Gifted and Talented Exceptionality (GATE) program as well as students from the Bridal Path homes, an affluent population. These two populations are to be transferred to other campuses. Berylwood Elementary population has changed from middle- to lower-class socioeconomic status (Dinehart, Note 8).

Ethnic distribution at Berylwood on July, 1983, was (a) American Indian or Alaskan-Native, 1.4%; (b) Asian or Pacific Islanders, 2.9%; (c) Philippine, 0.2%; (d) Black, 2.1%; (e) White, other than Hispanic, 85.7%; and (f) Hispanic, 7.7% (MacLeod, Note 10).

Auxillary personnel include the psychologist, nurse, and speech/language therapist. This writer is the speech/language therapist assigned to Berylwood Elementary regular classes and the seven special education programs on campus. This writer also serves one junior high school and three special education classes housed on the junior high school campus. Duties include speech/language screening, diagnostic testing for remediation and/or staffing into special programs, remediation of speech/language problems, consultant, etc. All kindergarten and first-grade students are routinely screened every year for speech/language problems. This year, additional tests will be included as basis for this practicum.

Chapter II

STUDY OF THE PROBLEM

Problem Statement

No phase of language acquisition is more important to personal development than mastery of vocabulary and syntax. The years of childhood are filled with diverse experiences at home, school, and playground. Speech of others is an integral part of these experiences. Experiences illustrate and define language. Idiomatic expressions, qualitative differences, and naming are learned as a result of experiences. No child can amass a satisfactory store of language symbols unless able to perceive the auditory stimuli which are part of these experiences.

Auditory problems are not always acuity weakness. A child's, as well as an adult's, acuity generally is better than need be. The ear's useful frequency is between 20 and 20000 cycles per second (cps). Communication requires only a frequency range from 100 to 4500 vibrations or cps. Until the age of 7 months, development of baby's speech, thinking, and language proceeds slowly along with hearing maturation. As auditory discrimination reaches its peak, language as a tool of communication of feeling, thought, and experience grows rapidly.

A problem is occurring which hampers learning. Children entering school are expected to be experienced at an unconscious level in the basic signals and structures. However, many children are entering without basic concepts and with smaller vocabularies even though they may have attended preschool. Other children who

come to school with intact vocabularies are not progressing as fast as others. No reason is apparent. Although these children have normal intellectual potential, they are having difficulty following oral instruction and are unable to perform basic academic tasks required in the classroom. This describes a child with auditory closure disability. Wood (1974) stated,

Where this problem is present, the resulting behavior may be classified as "disobedience" or "rebellion," although, in reality, this behavior may be a manifestation of the child's confusion in listening. (p. 82)

This is neither a new problem nor one indigenous to a specific area. Luria (1961) conducted experiments in the 1930s with children described as fairly normal intellectually but who became exhausted, lost the ability to concentrate, and extraneous stimulus distracted them from their work. After 5 to 10 minutes, they began to exhibit complete incomprehension of the tasks presented by the teacher. These students either answered questions by guesswork or no longer participated in the work of the class at all.

Testing to prove the existence of a disability is not easy. Martin and Clark (1977) explained,

The clinical audiologist is often confronted with a child whose parents suspected a hearing loss; however, when tested, the child's test results reveal normal hearing sensitivity for pure tones and speech. Unless the child exhibits an obvious language disorder, the usual course the audiologist takes is to tell the parents that the child has normal hearing, and make no further referrals. (p. 140)

The most recent audiological evaluation technique provided for auditory processing is dichotic listening but few children are tested. Even children considered eligible for special class placement are not routinely administered an auditory figure-ground test. Reasons are (a) calibrated equipment is required, (b) specialists are needed to administer the test, (c) the amount of time required to routinely test all children is cost-prohibitive, and (d) not all children manifest this dysfunction. Therefore, preventative techniques rather than remediation are required.

Many young children entering Berylwood School are not able to learn in the distracting environment of the classroom because of an auditory figure-ground disability. These children need techniques to aid them in their attending skills.

Evidence of the Problem

One of every 10 school-age children in America has a learning disability according to John Rosemond (1982). He noted that in the last 30 years, incidence of functional illiteracy among 17-year-old persons in this country had risen, corresponding to a steady decline in scholastic achievement test scores. This problem is apparent in Simi Valley. Many children are not passing the Comprehensive Test of Basic Skills (CTBS) which assesses academic competency at four grades beginning with third-grade. Teachers are complaining that children seem to pay less attention than in their previous classes. Primary teachers complain that students can not follow directions; upper class teachers bemoan the problem that children do not know how to read. Each teacher blames the parents and/or previous

teachers.

Children unable to learn basic school subjects in primary grades experience an ever-increasing disability as later teaching is always based on competencies presumed to have been established earlier (Ross, 1980). Younger children do not always realize that classroom instructions were not understood; older children might realize a problem exists but do not wish to ask for help because they would feel "stupid." Often the same situation exists at home. Parents will comment that the child "tunes them out" or "won't listen." Parents do not realize that these children may not be attending because they do not know what to attend.

Parents might blame the teacher. Parents do have difficulty understanding that their child would have problems in the classroom when the child is able to understand the assignment easily after it is explained at home. When teachers complain about children's short attention span in the classroom, the parent's comment is often that the child is able to sit in front of the television set for hours. Children do not have to rely on auditory cues to gain meaning from televised programs.

Winnick and Winnick (1979) reported regular viewing typically begins around age 3 and stays relatively high until 12 years of age, after which it declines. A survey was conducted to examine the viewing habits of the primary classes at Berylwood Elementary School (see Appendix A for complete derivation). Results showed that 48.4% kindergarten and 70.6% of first-grade children watched TV more than 2 hours daily (Frank, 1983). The first six years are the formative years and the most critical developmental period in the child's life

(Rosemond, 1982) but this time is being absorbed by television.

Two case histories illustrate the problem. Mrs. P., mother of a third-grade student remarked that her son was having an extremely difficult time in his class. She helped him with his homework. He had private tutoring but his report card grades were Ds and Fs. For some reason, he was able to do his spelling correctly at home but would always fail when he took the test in class. Mrs. P. complained to the teacher, principal, and everyone who would listen. Although this student had a history of poor grades, his name had never been brought before the School Guidance Team. The third-grade teacher thought the student wasn't paying attention or wasn't capable. "After all," the teacher declared, "he had scored the lowest in the class on the CTBS tests." The mother requested in-depth speech/language testing. All areas appeared to be adequate for learning except auditory closure and attention span. Diagnosis was auditory figure-ground disability.

A second-grade female was also experiencing difficulty in class. Even though her intellectual ability was high, the student was still reading at a primer level. The mother blamed the homeroom teacher and was able to transfer her into another room for reading. She was also eligible to receive additional reading instruction from the Miller-Unruh Reading Specialist who described her behavior as hyperactive and impulsive. The homeroom teacher referred her to this writer because the student was unable to tell a story or sequence her thoughts. Tests were administered and again all learning areas were adequate except auditory closure and attention span. She was

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taught to use verbal rehearsal and mediation techniques. Following auditory directions with background stimuli was not used until the final sessions. At first she would make statements such as, "What did he say?" and "I didn't hear that." Often, she would verbalize the correct command but perform an incorrect response (e.g., student would pick up a blue crayon while repeating, "Draw a red line under what?"). This student gained a remarkable 15-Scaled Score points on the auditory closure test and was dismissed. She had changed completely from the hyperactive, distractible student who used to put her feet on the desk. Her mother's opinion of the school also changed for the positive.

Many children who manifest this problem are not always found eligible for special help because when they are tested by the psychologist, they do not score significantly below their ability level. Testing is performed on a one-to-one basis and these children have the greatest difficulty attending in the classroom.

In September, 1983, children entering kindergarten and first-grade were tested for auditory closure ability. Of the 58 children enrolled in kindergarten, 12 children manifested closure test scores below one stanine from the mean. In the first-grade, 83 children were tested. There were 22 first-graders who did not score within the normal limits on this test (i.e., Scaled Score 36+/-6).

Children with this problem may learn to compensate but too many will require special training in later years.

Cause of the Problem

Auditory perception involves focus, attention, tracking, sorting, scanning, comparing, retrieving, and sequencing of spoken messages at the moment of utterance (Witkin, 1971). Auditory perception is usually divided into many specialized abilities (e.g., auditory discrimination, sequential memory, association, closure, figure-ground, sound blending, etc.); however, there is disagreement as areas overlap. Lerner (1971) and Richardson (1977) included auditory closure and sound-blending under the title of auditory blending (closure) and defined this area as the ability to put together isolated phonemic elements into a word. The Ability to synthesize is sound blending but auditory closure is not the obverse and, therefore, should not be considered as counterparts of one ability.

Kirk (1982), one of the authors of the Illinois Test of Psycholinguistic Abilities (ITPA), would no longer consider these abilities psycholinguistic but rather communication behaviors. Another lack of consensus arose over whether auditory attention is a perceptual task or a quality. This paper concentrated on auditory figure-ground disability which, in this writer's opinion, is created primarily by an auditory closure disability complicated by a short attention span. These three areas were explored.

Perception is organization; therefore, auditory imperception or disability is confusion (i.e., an inability to structure the mass of impinging auditory impulses). To determine cause(s), symptoms were researched. Characteristics of auditory perceptual disability are (a) inability to organize auditory events in the environment so that

events have meaning (Richardson, 1977); (b) inability to attend to a stimulus deemed significant in the presence of competing insignificant stimuli (Keith, 1981; Northern & Downs, 1974); and/or (c) poor ability to synthesize or integrate sounds or to separate sounds presented to the two ears (Keith, 1981). Even though this is not a peripheral hearing loss which can be detected by pure tone (Bocca & Calero, 1963); Northern & Downs, 1974), both peripheral and central processing disorders may exist in the same individual (Northern & Downs, 1974).

Luria (1961) attributed the symptoms he observed in his subjects to disturbance in the vascular system or cerebrospinal fluid caused by brain traumas, infections, intoxications, and dystrophy. Dystrophy cases were wide-spread after the German occupation in the 1930s. He named it cerebroasthenic syndrome.

Exact mechanism and neurophysiology are not known (Witkin, 1971). Bocca and Calero (1963) cited reasons for the lack of neurological evidence:

The difficulty of defining the symptomatology of the central auditory system coincides substantially with the problem of determining the mechanisms that may contribute to the realization of a nerve function that is strongly differentiated. Neither the study of the anatomical structures and substrata, nor electrophysiological research or experimental physiology are of much help in explaining it. (p. 338)

A few reasons for an inability to accomplish auditory closure tasks were presented by Kirk and Kirk (1971). They suggested that the child may (a) not have had sufficient exposure to the material

being presented; (b) lack adequate short-term memory; (c) not re-activate what is heard, either vocally or subvocally; and (d) not learn readily even when experiences have been repeated many times.

Children showing these behaviors appeared to be more prevalent than in the past. Furthermore, the behavior was appearing earlier. Willeford (1977), director of a speech and language clinic, wondered about the sharply rising increase in the number of children being referred to his clinic who were diagnosed as manifesting auditory perceptual dysfunction but with no involvement from the audiologist in either diagnosis or treatment. On the basis of his study, he proposed dichotic listening to be the cause. Berlin, Lowe-Bell, Cullen, Thompson, and Loovis (1973) concurred. Since the human auditory system is organized, almost from the cradle, to listen diotically to the vocal stimuli, any deviation must then be considered a possible cause (Berlin et al., 1973).

Another cause noted has been the time gap between the listening rate of 328 words per minute (wpm) and the normal speaking rate of 178 wpm. The listening rate was found to be more efficient for learning. It was reasoned that good listeners may be able to utilize the time gap more efficiently than poor listeners.

Dysfunction of the auditory modality as a pathway for learning has commonly been cited as a reason for learning problems. Many researchers (Dykman, Ackerman, Clements, & Peters, 1971; Hammill & Larsen, 1974; Rees, 1973, 1974, 1981) did not support this theory. Rees (1973) summarized, "The search for a single auditory skill, or even a set of auditory abilities, that is essential to language

learning or impaired in all or most language-disordered children seem futile" (p. 312). Dykman et al. (1971) determined that disorders of learning, usually thought to result from faulty auditory processing, were reducible to disorder of attention.

Disorder of attention may be caused by television viewing. In early years, especially through first-grade, information viewing was found not to prepare the preschool child for the type of education required in school. In reality, television contributed to learning disabilities (Arnold, 1971; Fransecky, 1979; Rosemond, 1982) as visually-presented information did not relate to learning of aurally-presented information (Welch & Watt, 1980). Constant bombardment of sound caused children to become skillful at not listening (Lerner, 1976). Winn (1977), basing her research on informal interviews with middle-class families, concluded that TV was as addictive as drugs or alcohol.

Other serious effects of media viewing were that TV does not (a) allow for rehearsal to build long-term memory, (b) allow any type of motor response, or (c) offer feedback in that the viewer could question and gain understanding. Arnold (1971) revealed,

Least successful programming on Sesame Street, by admission of its producers, are stories read to and told children on the air. The children fail to respond. This failure dramatizes the fact that Sesame Street cannot teach the very things it claims to provide - incentive to listen, to think, to question, to imagine, to classify, and to acquire pre-reading skills. (p. 173)

Richardson (1977) elucidated that normal and perceptually unimpaired children miss auditory cues because of shifts of attention or masking from background noises. She noted that children with poor vocabularies may be more susceptible to figure-ground difficulties

and recommended auditory closure as one facet of perceptual skills which aided children in message retrieval. Her recommendation may be reinterpreted to support this writer's postulation that disability in auditory closure would not aid in message retrieval and, by not doing so, reduce vocabulary.

Related Literature

Two language modes of receiving information and ideas from others are listening and reading. Children become knowledgeable primarily through the auditory channel in preschool and the first years at school (Bangs, 1968). Schreiber (1980) discovered almost all comparisons between reading versus listening comprehension favored the listening comprehension mode in first- through the sixth-grade. Bangs (1968) wrote,

With listening experiences, children use their oral language system to develop concepts of everyday living and to influence people around them as well as to become prepared for formal learning. (p. 2)

She cautioned that an inability to use receptive skills and oral language properly is a deterrent to academic success on the most basic level. Early training had to take place before the child was 6 years or public money would be spent in remediation.

Research studies showed a high correlation between receptive language skills of listening and reading and that instruction in listening comprehension was likely to result in improvement in reading comprehension (Lerner, 1976). Language in all its facets is an integrated phenomenon. When an individual has a figure-ground or

competing sound stimuli disability, it often represents serious learning blocks. Heasley (1980) expounded,

His listening attention is easily distracted from presentation of important information to extraneous, irrelevant sounds near him, in the same room, or even outside the room where he is attempting to work or study. (p. 99)

Basic Considerations of Auditory Processing

Hearing develops sooner than vision. The newborn, including prematures and those with known abnormalities of the Central Nervous System can differentiate sound on the basis of at least these variables: (a) bandwidth, (b) duration, (c) repetition rate, (d) interstimulus interval, (e) frequency, (f) sound pressure level (SPL), and (g) dimensionality. The mechanism governing behavior is operant in full-born but not premature babies (Eisenberg, 1970). Eisenberg (1970) concluded that infants' hearing mechanisms are pre-adapted to language acquisition.

The ear is so sensitive that it translates sound between some 16 and 20000 cps into nerve impulses (Von Békésy, 1957). It is less sensitive at low-frequencies. Von Békésy (1957) established that this comparative insensitivity to the slower vibrations was an obvious physical necessity because we would hear all the vibrations of our own bodies. On the high-frequency side, some children hear well at frequencies as high as 40000 cps. But, with age, acuteness of hearing in the high-frequency range steadily falls.

Speech reception occurs when energy is concentrated in a particular frequency region. Denes and Pinson (1966) elaborated that the

individual does not perceive sounds but rather syllables. Syllables are formed by either a vowel or a vowel surrounded by one or more consonants to form parts or whole words. Words combine into sentences. Sentence word order is influenced by grammatical rules and semantic considerations.

Certain obvious features distinguish one speaker from another (e.g., accent, rate, loudness or softness, quality). Broadbent (1962) clarified that one could not use these features until one knows which frequencies belong to which voice. Speech recognition was accomplished by a combination of linguistic cues. Cues available were far in excess of what was needed for satisfactory recognition (Denes & Pinson, 1966). Northern and Downs (1974) emphasized that an individual does not speak in carefully articulated phonemes but slurred sounds and sometimes reducing other sounds to inaudibility. Speech was a *gesalt* consisting of distinctive rhythms, durations, intonations, interconnecting transients and almost incidentally specific frequency formants. However, Bocca and Calero (1963) explained that the sound message has structure, probability, and redundancy.

Memory

Memory plays a key role in most aspects of cognition. Auditory signals cannot be coded, interpreted, and carried in the memory except for short periods. Northern and Downs (1974) related,

If a child cannot store the meaning of a sound in his brain, he must forever reinvestigate the sound whenever it is heard. This compulsive behavior of attending to any and all sounds in the environment causes the hyperactivity of this type of child. (p. 78)

Largely acoustic in nature, information was found to be held in the so-called preperceptual auditory storage for about 250 milliseconds. At this point, primary recognition for perception occurred (Butler, 1981). Short-term memory was approximately 1/10th of a second. Auditory images would prevail as much as 1/2 second. Not only was there limited retention time, there was also limited quantity that the brain could hold in the memory bank and distinguish in a given time. Because of this limitation, two messages arriving simultaneously were harder to understand than two messages arriving one after another (Broadbent, 1962). Richardson (1977) warned that the individual must also have the ability to attend to one message without being confused by the other. Comprehension improved when there were differences in certain physical characteristics (e.g., man's voice opposed to a woman's, location) (Broadbent, 1962). Whenever the amount of information exceeded the listener's capacity, only part of the available information was accomplished through coding of incoming messages into fairly broad categories for initial acceptance or rejection. Accepted material was transferred for further processing or storage.

Vygotsky (edited by Cole, John-Steiner, Scribner, & Souberman, 1978) theorized two principally different types of memory even at the earliest stages of social development. One was nonmediated impression of materials laid down by retention of actual experiences. Vygotsky called this basis of mnemonic (memory) traces, "natural memory." At this first stage, preschool children were not capable of mastering behavior by organizing special stimuli. Mediated remembering, second stage, occurred as auxiliary stimulus

acted from outside. Internalization occurred in the adult stage with many transitional psychological systems occurring between stages.

Waugh and Norman (1965) proposed a model dealing with memory and containing mnemonic strategy. Primary memory was described as an independent storage structure with limited capacity. Information was forgotten rapidly with only the most recent item being recalled from a list. Information in the primary memory was displaced by new, incoming information rather than merely decaying but could be retained indefinitely through rehearsal during the presentation and recall. Rehearsal transferred the recently perceived verbal items to the more commodious storage for later retrieval. Recently perceived items were able to be retained in both stores at the same time.

In summary, span of immediate memory appeared to be limited largely by the ability or inability to rehearse.

Mnemonic Strategies - Critical Factors

Mnemonic strategies are critical factors for retention and transfer. Butler (1981) confirmed, "If the child does not utilize efficient strategies of rehearsal and recall, there may be insufficient time for the child to respond appropriately to incoming auditory stimuli " (p. 171).

Three systems of representation based upon action, imagery, and language were distinguished by Bruner (1973). These were enactive representation, iconic representation, and symbolic representation. Representations were "knowing something through doing it, through a picture or image of it, and through such symbolic means as language" (p. 316). One system of representation was supplemented by sub-

sequent systems. Young children showed remembrance by doing or acting out past experiences and representing them by an action, object, or word. By age 5, children were found to be capable of carrying sensory imagery to a task; by 8 years, children were able to deal with information properly defined. Bruner (1973) recounted,

Symbol representation is clearly the most mysterious of the three. Present evidence suggests that much of human syntax - rules of stunning power - is learned in the two or three years between the ages of 2 and 4 or 5. (p. 317)

Change in memory between 5 through 11 was a consequence of the child's gradual acquisition and mastery of sophisticated mnemonic strategies. Hagen (1975) listed verbal labeling; verbal rehearsal; anticipation, or testing oneself; and pointing only. Use of verbal labeling pointed out the relationship between stimulus and desired response (Ross, 1976; Wooten, 1980). Verbal rehearsal was depicted by Flavell (1970) as a "planful, instrumental act akin to problem-solving behavior" (p. 207). Anticipation and pointing only were found to be used at the fourth-grade level (Hagen, 1975). Wooten (1980) delineated verbal mediation as a technique which effectively enhanced selective attention and memory in older students.

Hagen (1975) discovered consistent recall by children as young as 2 years was affected by categorical relationships (i.e., taxonomic and associative relationships). Children as young as 4 years might have appropriate verbal responses to stimuli in their repertoire but did not use them. A hypothesis was presented by Reese (1962):

If mediation is a voluntary process as rehearsal, there may be a stage in which subjects have typically not learned to use it, and instruction in the use of the process should facilitate the

learning of these Ss. If it is an involuntary or automatic process, instructions should have no effect. (p. 507)

Reese reasoned that deficiency in mediation in younger children, when compared with older children, might be characteristic of an earlier stage of concept formation. Inadequately stimulus, if used for rehearsal, might also produce interference.

In 1966, Flavell, Beach, and Chinsky studied mediation of kindergarten, second-, and fifth-grade students. Their results supported Reese's assumption. The youngest did not rehearse while the oldest used covert rehearsal. Conclusion drawn was that (a) verbal rehearsal was a mediator of effective recall in older children and (b) younger children had a "mediational deficiency" because of failure to produce an appropriate word or phrase to stimulate the desired response.

Although a developmental increase in detectable verbal rehearsal was noted between the ages of 5 and 7, spontaneous use was seldom employed by children under 6 years (Flavell, 1970; Hagen, 1972) or after 10 years (Hagen, 1972). Flavell posited that mediation was not an all-or-nothing affair but that developmental inefficiencies were probably the rule not the exception. He suggested that the growing child (a) overlearned verbal-label responses to object stimuli and (b) became skillful and better attuned to sequencing and recycling (i.e., starting at the first word) rules of repeated rehearsal.

Recent research has shown that production deficiency rather than a mediational deficiency exists (Bray, Justice, Ferguson, & Simon, 1977; Keeney, Cannizzo, & Flavell, 1967; Kobasiqawa, 1974; Moely, Oleson, Halves, & Flavell, 1969; Tinsley & Waters, 1982;

Vlietstra, 1982; Yussen & Santrock, 1974). Children as young as 2 to 5 years could use overt verbalization (Tinsley & Waters, 1982). Saying names was more facilitating than hearing names in preschool children (Yussen & Santrock, 1974). Kobasiqawa (1974) reported that retrieval in kindergarten children was elicited by a brief demonstration or light prompts. However, kindergarten or first-grade children would not even try to use such skills unless given explicit modeling on how to do it (Bray et al., 1977). Vlietstra (1982) concluded that the younger child might not mediate because there is a preference to explore at this age.

Difference between spontaneous rehearsal and unmediated behavior was investigated by Keeney et al. (1967). Children were administered a nonverbal serial recall task. Conclusions drawn were (a) children who spontaneously rehearse sequences of recall items retained better than children of the same age who did not spontaneously rehearse and (b) nonproducers learned to rehearse quickly and easily. However, investigators found that effects were short-lived and limited. After only 6 weeks, 10 of the 17 nonproducers completely abandoned whispered rehearsal while only 1 of the 12 producers did not use it. A child of any age who knows object names would be helped by rehearsal. However, it must occur to the child to use the technique (Hagen, 1972; Moely et al., 1969; Ross, 1976) and there must be a purpose for using it (Hagen, 1972).

Older students who had already acquired a fairly effective strategy in their problem-solving should not be forced to verbalize (Ross, 1976). Voiced rehearsal was found to take longer, leaving more time for forgetting of items yet to be rehearsed (Murray, 1967).

Murray (1967) clarified that the act itself might prevent rapid subvocal rehearsal.

Selective Attention

One of the most familiar descriptions of children manifesting auditory figure-ground disability is that they can not pay attention in order to follow directions. Butler (1981) reported that there are many ways to look at attention. There is the global attitude taken by parents, teachers, and specialists generally equating attention with following directions or paying attention and the type which requires only an input of information.

Selective attention is a state in which the individual becomes set to select and respond to a specific pattern of stimuli or to one situation to the exclusion of others (Berry & Eicenson, 1956). Shworn (1979) posited that selective attention is so essential that no relevant learning could occur without it. Children not initially attending to and selecting relevant task properties might develop limited response repertoires that affected generalization and later learning. According to Ross (1976), young children displayed little incidental learning where selective attention was high. They were easily distracted by irrelevant features and could sustain attention for short periods of time.

"Attention cannot be increased or diminished," stated Simon (1972), "it can only be reallocated" (p. 15). Simon explained that storage of new chunks in Long-Term Memory (LTM) caused the change in attention rather than an actual growth in physiological capacity of memory, but evidence was not conclusive. Two reasons that might

cause young children to waste attention on irrelevant stimuli processing capacity instead of the central task were (a) insufficient strategic control over attention and (b) a low threshold to interruption of central processes in the stimulus.

The overinclusive selective attentive child responded to everything, including stimuli emanating from inside the body (e.g., growling stomach). Ross (1976) established,

The frequently reported distractibility and hyperactivity of children with learning disabilities may thus be no more than another aspect of their problem with selective attention, a problem which, from the present point of view, may well be the source of the learning disability. (p. 42)

Researchers (Hagen, 1967; Miller & Bigi, 1979) have studied development of children's understanding of attention because concepts of attention might intimately relate to development and utilization of attentional skills. Two categories of knowledge were determined. First category included relevant variables such as one's motivational attentional capacity, self-control, age, intellectual level, and distractors. Second category included knowledge that nature of the situation was important (e.g., amount of noise, distraction).

Relevant Variables

Developmental changes in attention allocation as well as memory abilities increase with age during childhood. Hagen (1967) studied development of selective attention processes using audio distraction (i.e., tape recording of high notes on a piano with periodic low-pitch interruptions). He found that auditory distractors had a highly significant effect on central performance. Recall of task-

relevant material increased regularly with age regardless of distraction while recall of irrelevant material did not increase between grades one and five. Recall of task-irrelevant material did decrease between grades five and seven.

Further processing did not occur at older ages for set-relevant materials at the expense of incidental cue attending. Hagen (1967) elaborated two possible factors for this change. One, with increased age, need for stimulus redundancy decreased; and with this decrease, a higher rate of information processing was allowed. The other possible factor, with increased age, ability to focus attention on task-relevant cues increased.

Miller and Weiss (1981) studied predominantly white, middle-class second-, fifth-, and eighth-grade students. Second-graders (a) had inefficient attention allocation, (b) did not efficiently filter out irrelevant information, and (c) had limited attentional capacity. Efficient strategies of attention allocation were found to develop primarily between second- and fifth-grade, with only moderate further process by eighth-grade. Second-graders had little concern for whether information was irrelevant or relevant.

In contrast, Miller and Jordan (1982) found that Puerto Rican second-grade students' strategies were more efficient and eighth-graders less efficient. Miller and Jordan rationalized that fewer assessments were given in Puerto Rican schools and thus second-graders might have been more motivated.

Distracting influence of fluorescent lights on hyperactive and learning disabled first-grade children were investigated by Ott (1976). Children in rooms with standard cool-white fluorescent

tubes and fixtures with solid plastic diffusers were observed to be fidgety to an extreme degree. These children were leaping from their seats, flailing their arms, and paying little attention to the teachers. Children in experimental classrooms had the cool white fluorescent tubes replaced with full-spectrum fluorescent tubes that more closely duplicated natural daylight. These first-graders settled down more quickly and paid more attention to their teachers. Less nervousness was evident and overall performance was better. An aspect which has not been taken into consideration is the high-frequency sound emitted by the fluorescent tube.

Knowledge of Variables

Realizing that younger children overestimate their memory span, Miller and Weiss (1982) believed that knowledge of this area required research. They reasoned that if children did not know that the amount of information might exceed their attentional capacity, the children were not likely to see the need for attention allocation for important information. Results of this study with preschoolers and kindergarten children indicated that younger children did understand the importance of interest level in situations with distractions. Kindergartners, however, thought that order of looking affected performance not what was seen.

Kreutzer, Leonard, and Flavell (1975) interviewed kindergarten, first-, third, and fifth-grade children to sample their knowledge concerning metamemory. Kindergarten children and first-graders understood fairly well the meaning of the words (e.g., learn, remember, forget) but there were limitations to memory capacity at this

age. Children in third- and especially fifth-grade appeared considerably more playful and self-aware in their approach.

Metacognition experiments were designed to determine the age children (a) become aware of potential distractors, (b) learned these distractors could disrupt learning, and (c) understood that focusing strategies could aid attention. Investigators (Miller, 1982; Miller & Zalenski, 1982) rationalized that children were not apt to remove distractions or make a special effort to concentrate on a task unless they understood distraction and could distinguish what was distracting. Kindergartners were found to have insight into causes of inattention. Interest level influenced their judgments more than noise level (Miller, 1982). Preschool children, ages 3 and 4 years, understood that noise and lack of interest hindered attention and concluded that interest was more important than noise (Miller & Zalenski, 1982). Miller and Zalenski (1982) confirmed there was evidence that preschool children had rudimentary understanding but unlikely that they consistently applied this knowledge in real life.

Using an interview procedure, Miller and Bigi (1979) established that first-, third-, and fifth-grade students understood (a) they sometimes had trouble attending, (b) some children attended better than others, and (c) certain situational and age variables affected attention. In contrast to kindergartners and preschoolers, young elementary children were more likely to mention noise level than children's level of interest when explaining inattention.

Even though children might presume understanding, they might not always be aware that they did not understand. Markman (1977) gave first- and third-grade students instructions for a game but omitted

information. Younger children were unaware of the inadequacy of the message, and 16 out of 20 had to ask a relevant question. Furthermore, 13 of these 16 did not question until they began to enact the instructions; in contrast only 4 of the 18 third-grade students who asked a question had to enact the instructions before they realized they had not understood. Markman concluded that this might be due to superficial processing on the part of first-grade children.

Vlietstra (1982) postulated that younger children frequently do not follow instructions because they are attending to perceptually salient cues. In Western culture where the emphasis is on reading, Vlietstra found the shift from preference of stimuli based on color to form occurred about 5 years of age. Forms (shapes) are needed for letters and words. Because the Islamic schools in Nigeria placed their emphasis on memorization, these children failed to show a preference for form even in adolescence. Vlietstra concluded that children could be trained to follow directions.

Auditory Closure

Auditory closure weakness often precludes a low vocabulary or a lack of basic concepts. Auditory closure is the means of decoding sets of impulses when impulses are only partial (i.e., ability to fill-in missing gaps). Richardson (1977) offered the following information for partial stimuli:

Some stimuli are lost in transmission through the environment, some are lost in transduction in the cochlea and some are lost enroute to the higher centers of the brain. Such disturbances as faulty or distorted sound production, stimulus obliteration by loud noise and shifts of listener attention may cause gaps in the sequences of impulses (cues) that are available for decoding, yet meaning can be achieved through the process of

closure. This process is possible because of the manner in which objects are perceived; immediately, without analysis and as a whole. (p. 285)

Wood (1974) defined auditory processing (i.e., closure, discrimination, etc.) as a possible prerequisite to the acquisition of complex linguistic skills. Others disagreed. Ferry (1981) considered closure a language-based skill that was not fundamental to learning language but which emerged as one acquired language. Richardson (1977) specified closure as being dependent upon factors of maturation and learning. Rees (1981) theorized that auditory synthesis and closure were metalinguistic skills that presupposed a good deal of sophistication.

One finding from Wood's study which would receive little if any dissension was her contention that although a child might be able to identify words presented under ideal conditions, the same ability might not be maintained under conditions of stress, as was the case with competing messages.

Listening in Noise (Auditory Figure-Ground)

Attending to one message in the presence of another distracting one is considered an auditory figure-ground perceptual task (i.e., selective listening). Everyone is aware that sounds are harder to hear in noisy surroundings. Individuals shout at football games or in moving cars but a whisper can be heard in a library.

Ability to detect signals in the presence of noise was reported to develop early by Siegenthaler and Barr (1967). Investigators tested the ability of children 4 to 11 years using signal-to-noise ratio (S/N). Boys and girls, age 4 and 5 years, performed equally

but as age increased, boys tended to perform better. Girls were found to have relatively stable ability between 4 and 9 but at approximately 11 years, there was an increase in S/N perception. Boys 6 through 11 years had increasingly better S/N ratios. Conclusion was that age factor in S/N appeared to parallel increased hearing acuity.

An aspect other than quantity of speech perceived in noise investigated was manner of perception. Broadbent (1962) theorized two attention mechanisms (i.e., selection on the basis of physical characteristics and basis of content). Physical characteristics enabled speech to be intelligible even when (a) its intensity was lower than that of noise, (b) noise and speech came from different directions, and (c) neither all high-frequency nor all low-frequency components were heard (Denes & Pinson, 1966). Denes and Pinson (1966) credited the listener's ability to realize how much slurring to expect from each speaker's talking speed as well as articulatory peculiarities for the phenomenon of understanding speech-in-noise.

George Von Bekesy (1957) marveled that the ear had a built-in inhibitory mechanism which ignored all sounds except the first sound that struck it. In this way, the speaker was able to suppress most of the noise in the crowded room in order to concentrate on one speaker. Von Bekesy remarked that the conductor's ear was so attuned that one instrument not performing to satisfaction could be singled out in the blended sounds of a symphony orchestra.

Evidence showed that only a fragment of many messages was needed to decipher meanings (Bocca & Calero, 1963; Cherry, 1953; Cherry & Taylor, 1954; Dykman et al., 1971; Warren & Warren, 1970). Warren

and Warren (1970) reported an experiment in which phonemes were deleted by superimposing a cough. When the doctored sentence was played to listeners, the missing sound was clearly heard. Investigators called this "phonemic restoration." Phonemic restoration also occurred when other sounds (e.g., buzz or tone) were inserted. As long as the extraneous sound was of the same duration and loudness, the omitted sound or even syllable would be heard. However, Warren (1970) discovered that if the missing sound was not restored and a silent gap was left, the gap could be located and identified by listeners.

Witkin (1971) related that rate of thought is approximately five times the rate of speech. It is speculated that the listener may have thought that the words were actually said.

Attention mechanism of content for speech-in-noise perception has many supporters. Denes and Pinson (1966) observed that frequent travellers had little problem recognizing names of train stations or departure gates while occasional travellers were bewildered. They reasoned that familiarity with subject matter made speech intelligible even when cues were ambiguous and not sufficient for recognition.

Dichotic experiments were conducted to determine how one conversation among several equally audible conversations (i.e., cocktail-party problem) was accomplished. Researchers (Cherry, 1953; Cherry & Taylor, 1954) found that subject matter, as well as voice quality and syntax, aided the perception of only one speaker as a "gesalt" when ears were stimulated by similar messages. This occurred even with a time delay (6³/₂ seconds). Interestingly, when one spoken message was fed to the right ear and a different message spoken to the left

ear (i.e., dichotic listening), the subjects were able to repeat but without understanding (Cherry, 1953; Cherry & Taylor, 1954).

The Right Ear Advantage (REA) theory (i.e., right ear dominance in simultaneous listening tasks) was supported by Berlin et al. (1973). They specified that the right ear usually generated superior dichotic scores even when receiving 10dB less intense speech than the left ear. Geffen and Wale (1979) noted involuntary perceptual asymmetry depended on left hemisphere language superiority which was present at birth.

REA, unlike other abilities, was found not to increase with age. Geffen and Wale's 1979 studies showed that younger children responded in terms of their perceptual asymmetries (i.e., divided their attention). Adults displayed no REA in a focus attention task. Geffen and Wale posited that 7 years was the transition stage in flexibility of attention. Their research with middle- and lower-class children indicated socioeconomic differences in REA but investigators emphasized that middle-class children adopted strategies which maximized their performance while lower-class children did not. It was not, they reasoned, because language capacities were less lateralized.

Millsapps (1978) investigated REA differences under monaural and binaural listening conditions. REA difference was not present in monaural listening but a significant difference was indicated between monaural and binaural performance under noise conditions. Results suggested superiority of binaural over monaural listening abilities in auditory figure-ground choice.

A series of selective listening (auditory figure-ground tasks) studies were conducted using competing messages. Maccoby and

Konrad (1966, 1967) reported (a) kindergarten children were able to distinguish male from female voices easily when voices were presented separately; (b) multisyllable words were heard more accurately than single words under binaural and dichotic listening conditions; (c) skill in selective listening increased with age, at least through the sixth-grade; and (d) older children were able to fill-in partially heard material on the basis of their knowledge of what words would be likely to occur in a given setting. Maccoby and Konrad wondered,

Do older Ss perform better in selective listening because they improve in hearing only the designated message and excluding the other? Or do they improve in hearing both messages, and edit out the undesired message at the point of reporting?
(p. 122)

Results were that subjects performed better if they receive a "before signal" indicating which of two voices they were to select. Investigators rationalized that it was due to a greater possibility of shifting attention to desired elements and therefore a longer stimulus.

Intelligibility was found to be dependent also upon the intensity or phonetic structure of the unwanted competing message (Hedrick, 1967; Witkin, 1971).

Children with language problems appear to have difficulty in attending closely to relevant stimuli in the presence of noise. Martin and Clark's 1977 study uncovered a significant difference between the learning-disabled group and the control group in processing abilities for a dichotic speech signal. In 1978, Millsapps compared 30 preschool children with delayed language and 30 pre-

school children with advanced language development. Findings supported the indication that children with delayed language development had a significantly lower performance in dealing with auditory figure-ground tasks.

Inner Language

Auditory closure disability interferes with building of inner language. "Inner language," as defined by Lerner, Mardell-Czudnowski, and Goldenberg (1981), "relates to the integration and organization of sensory and perceptual experiences the individual is continuously encountering" (p. 179). Receptive language, or the ability to listen and comprehend, generally developed simultaneously (Lerner et al., 1981) or immediately after (Myklebust, 1954) inner speech, supplying the child with necessary words with which to think, associate, and assimilate impinging experiences. Luria (1961) believed that there was a basic law in a child's development underlying mental processes. He proposed the following:

By naming various surrounding objects and giving the child orders and instructions, his mother shapes his behavior. Having carefully observed the objects named by his mother, after he acquires the faculty of speech, the child begins to name them actively, and thus to organize his acts of perception and his deliberate attention. When he does as his mother tells him he retains the traces of verbal instructions in his memory for a long time. Thus he learns how to formulate his own wishes and intentions independently, first in externalized and then in inner speech. He thus creates the highest form of purposive memory and deliberate activity. (p. 17)

In this way, Luria formulated the stages leading to inner speech. In the early stage of development, speech was insufficiently developed to act as a regulator of motor reaction. The feedback

principle was the main force of regulation at this time. The child's own speech began to play a regulatory role in the second stage. By the third stage, the child's speech became regulatory. And, in the last stage, speech became internalized. Formation of internal speech, closely bound up with thought would become the foundation for higher-level communication skills and a new, specifically human, stage of development.

Vygotsky (1962) referred to this process as "inner speech" while Piaget labeled this stage "preoperational thought." Vygotsky theorized that Piaget's egocentric speech, largely vanishing during early school years, went underground to become inner speech. Luria (1961) presented inner speech as a compensation to utilize when neurodynamics of motor reaction processes were not intact. He conducted experiments using Pavlov's "sound signalling system" to establish that speech did indeed regulate human behavior. Miller and Rohr (1980) reported that at the age of 6 or 7 years, electroencephalograph research had shown that this active speech became internalized but was still functioning.

Vygotsky (1962) clarified inner speech as thinking which was carried out with verbally based categories or meaning. If the thinker also retrieved words or phrases from the mental dictionary corresponding to these categories of thought, there would be words or phrases carried along with the process of thinking, but this step was not an executed part of inner speech. Luria appeared to attribute greater functioning power to inner speech. He emphasized that addition of speech yielded a generalizing property, allowing readjustment of perception and attention to memorizing and imagining and

to thinking and doing.

An investigation of the development of verbal control over motor behavior was conducted by Tinsley and Waters (1982). They compared relationships among language, thought, and behavior as a progression from little control by language over motor behavior, to control by overt (but not silent) vocalization, to internalized (i.e., not overt) control. Tinsley and Waters concluded that verbal mediation in problem and memory tasks appeared to be examples of distinct roles that language could play in relation to behavior and cognition. Describing the difference between Piaget and Luria, investigators noted that Piaget emphasized language as a reflection rather than a catalyst of cognitive growth.

Private speech of learning-disabled children 6 years, 9 months to 9 years of age were observed by Copeland, Milenko, and Jirkovsky (1981). Supporting Piaget's interpretation, the children's use of private speech was reflective of the level of cognitive maturity. Children who talked the most in the sample were of an intermediate level of skill in task performance and more mature children spoke less. Commenting on this finding, Copeland et al. reasoned this may have occurred because most of the self-regulation speech was in negative relationships and fantasy speech in the positive.

Blank's 1974 study indicated language played a significant functional role earlier than that commonly reported and temporal concepts could not be formed without verbal labels. An important finding because many of the young child's major abstract concepts contain such components as speed (fast and slow), duration (a long time, a little while ago), and sequence (first, last, before, etc.)

Poor ability to deal with time sequence has also been found in older children with language deficiencies.

Signs that receptive and inner language were intact were discrimination between sounds and showing understanding by responding appropriately to a request.

Prosody

Attention of the listener is not on speech sounds, words, or syntactical patterns but on meaningful material (i.e., meaning of the utterance or the intention of the speaker). Prosody is the factor which tells the listener which words deserve attention. Various researchers have found the lack of this facility leads to either reduced comprehension or increased processing time. Children with auditory figure-ground disability may have problems realizing stress importance as well as missing parts of words because the listening attention is so easily distracted. The normally-developing child has mastered most of the syntactical structures of colloquial adult speech by 4 years of age.

Pearson and Fielding (1982) researched listening comprehension. They determined that phonology and intonation patterns (rising and falling pitch) were involved in listening comprehension. Lefevre (1964) acknowledged importance of awareness of phonology in developing adequate reading skills but he stated that the most significant signalling systems for language were (a) intonation, (b) functional order in the sentence, (c) structure words, and (d) word form changes (i.e., nouns, plurals, possessives, grammatical inflections, prefixes, and suffixes). However, Lefevre agreed that under-

lying our language is intonation as intonation is the first to be learned by the child.

Children understand sentence conclusion, declaration statements, commands, requests, and many questions by the obligatory intonation feature (i.e., the fade-fall terminal). Sensitivity to variations in stress (loudness) patterns across words is necessary because stress patterns inform the listeners upon which aspect their attention must be focused. Pearson and Fielding (1982) concluded that intonation is perhaps the least understood signalling system of American English.

Johnson and Hook (1978) reviewed research relating to language processes, linguistic awareness, and reading. Children who had learning disabilities were found to be inferior to normal children in their ability to learn grammatical rules. Johnson and Hook (1978) attributed this to disorders in auditory processing. Children with reading problems were found to have more difficulty in recognizing the intonational pattern which marks a question.

Supporting Johnson and Hook, Wren's 1980 study compared the spoken language syntactical accuracy of 6 year old children. The children with severe disabilities were found to be highly deficient in syntax.

CHAPTER III

ANTICIPATED OUTCOMES AND EVALUATION INSTRUMENTS

Goals

Basic aim of educational procedures for children with a language disorder is to help them organize incoming stimuli so that useful concepts can result (Wood, 1959, 1961). Children with auditory figure-ground disability will have difficulty accomplishing this in an environment of distracting stimuli such as the classroom. The first basic goal was to teach alleviating techniques to the students and teachers. Second goal was that kindergarten and first-grade teachers be the catalysts for remediation.

Terminal Performance Objectives

Terminal performance objects were as follows:

1. Target children will gain in understanding of basic spatial and temporal concepts as shown by a change in the number of known concepts on the BTBC. It is anticipated that 60% of the target population will show an increase of five basic concepts.
2. Target children will gain in ability to fill-in missing sounds and thereby alleviate the auditory figure-ground disability. An anticipated 60% of the target population will show an adequate auditory closure score (i.e., a scaled score of 30 or higher).
3. Target children will show gain in "heard vocabulary" as assessed by the PPVT-R. It is expected that 60% of the

target children will show a 3-point increase on the PPVT-R.

4. Participating teachers will gain in understanding of rehabilitative techniques to build inner language through referent labeling. Objective is to be assessed by TQ Question #1.
5. Participating teachers will gain in understanding of characteristics, possible causes, interrelationships of abilities, and definitions of auditory figure-ground disability. TQ Questions #2 through #4 will assess this objective.
6. Participating teachers will learn methods to utilize rehabilitative techniques (i.e., verbal rehearsal, verbal mediation, and prosody). This objective will be assessed by TQ Questions #5 through #8.
7. Participating teachers will become aware of classroom management nonrehabilitative techniques. TQ Questions #9 and #10 directly respond to this objective.
8. Participating teachers will be able to note an actual change in children's ability to follow directions and/or understand messages. TQ Questions #11 through #15, Part II, evaluate this objective.

It was anticipated that 60% of the questions, Part I and II on the Teacher Questionnaire, would receive a positive response (i.e., "significant" or "moderate" ratings circled).

Evaluation Instruments

Four evaluation instruments were utilized to evaluate terminal performance objectives. Instruments used were the BOEHM Test of

of Basic Concepts (BTBC); Illinois Test of Psycholinguistic Abilities (ITPA) auditory closure subtest; Peabody Picture Vocabulary Test, revised edition, (PPVT-R); and author-devised questionnaire. Woodcock-Johnson Psycho-Educational Battery (WJPEB) subtest 3, memory for content, was to be administered for informational purposes only.

Tests, other than the author-devised questionnaire and BOEHM, incorporated any anticipated change for chronological age difference; therefore, change in numerical scores represented an indication of improvement.

Teacher Questionnaire (TQ) (see Appendix B) assessment instrument was a three-part objective test requiring a response of one of a 4-point scale.

In addition, test results were subjected to Campbell's Time-Series Design which does not require a control group. Test results were recorded pretest, preintervention, and postintervention. An indication of difference would be represented by a definite change in the direction of the graph line between pre- and postintervention test scores.

Basic Concepts Discussion and Statistical Information

BTBC is a test to assess attainment of certain concepts which are used extensively in primary grade curriculum materials. Dahl (1972) found fault with reliability. He stated that it was performed in a totally inappropriate manner. Split-Half reliability coefficients were used when BTBC should have been considered a criterion-referenced test with each concept being measured, not as a norm-referenced test. Validity suffered from an incompleteness similar to

that of reliability. According to Dahl (1972) the domain of examples illustrating a given concept cannot be properly represented by a single test item.

Auditory Closure Discussion and Statistical Information

In a classroom situation, the teacher's voice must compete with a background of whispering, murmuring, feet scraping, sounds from nearby rooms, air conditioning, fluorescent lights, outside sounds, etc. The amount of information obtained will depend upon the ability to attend to one message and tune out all other sounds. Various tests are used to yield information about a child's auditory behavior in a noisy classroom. The ITPA, one of the most widely used tests for allegedly evaluating auditory perception, has a supplementary subtest, auditory closure, which measures closure in a different way. This subtest was designed to measure the ability to utilize closure to recognize a word. Kirk and Kirk (1971) explained that this is the same kind of ability needed to grasp a telephone conversation when there are background noises interfering and blotting out parts of the sounds, understanding speech with a foreign accent, or speech with poor articulation. Closure skills deal with a highly integrated automatic response rather than a meaningful interpretation of symbols.

Reliability and validity of the auditory closure subtest was not as strong as desired. Chase (1972) commented that all tests of the ITPA appeared to have moderate reliability with visual closure and auditory closure the least reliable subtests in the battery. Chase found fault with standardization in that homes slightly above

the national average in income and education with middle occupation levels slightly overrepresented. The sample clearly underrepresented Negroes and Spanish-American children. Chase desired a wider sample of children which included both large metropolitan and clearly urban areas. Carroll (1972) believed that "the subjects measured a 'vocabulary' factor or rather, a factor having to do with the range of cultural experiences to which the child has been exposed" (p. 821). Our school system has frequently been critized because it is geared to middle-class Caucasian values. Authors of the ITPA desired a reference group against which learning disabilities and mental retardates could be evaluated.

Other testing instruments could have been utilized. The Goldman-Fristoe-Woodcock (GFW) Test of Auditory Discrimination (1970), like the ITPA, does not required calibration equipment. Although GFW is titled and used for a test of discrimination, Bannatyne (1975) claimed that this is a test of closure. He clarified that auditory closure requires matching against past experience therefore requiring long-term memory while discrimination is an immediate comparison between two stimuli presented almost simultaneously. GFW is divided into two parts. The first part consists of names without background noise. The second part, speech-in-noise, is clearly a measurement of closure (Bannatyne, 1975; Keith, 1981). This part masks part of the acoustic spectrum forcing the subject to understand the whole word when parts are missing (Keith, 1981). The test requires a high-fidelity tape recorder and earphones. Willeford and Billger (1978) noted that the test lacks control and judged it not reliable.

Goldman-Fristoe-Woodcock Auditory Skills Test Battery (GFWB)

closure subtest and the Flowers-Costello Tests of Central Auditory Abilities (TCAA) are examples of recent tests that attempted to overcome some of the limitations (Willeford & Billger, 1978). GFWB was reviewed by Butler (1978) and Oakland (1978). Test intercorrelations indicated that the various tests in this battery did measure different auditory traits or skills (Butler) (1978). Oakland (1978) criticized the small number of persons included in the standardization sample at each chronological age. Reliability norms were judged to be greatly inflated because of the correlations between GFW scores and age. Oakland judged the tests not as reliable as tests should be for the profile analysis of individuals.

TCAA, a tape recorded test using low-pass filtered speech (LPFS), contains a calibration system and earphones. Willeford and Billger (1978) recommended TCAA in that it controls the signal intensity and test environment. The LPFS portion, a presumed test of closure, was not found to be significantly related to the ITPA closure subtest (Anderson & Novina, 1973; Willeford & Billger, 1978). Scores on the competing messages subtest appeared to significantly covary with scores on most of the ITPA auditory subtests except auditory sequential memory and closure (Anderson & Novina, 1973). Auditory closure and LPFS are apparently of a qualitatively different nature and not closely related (Anderson & Novina, 1973). Willeford and Billger (1978) cautioned that speech-in-noise should not be used even as a screening device because it is not related to language.

Willeford (1977) concluded that all tests appeared to require the listener to have an adequate knowledge of language. He compiled

a calibrated test battery approach to diagnose listening difficulties using a dichotic speech signal (i.e., messages presented to both ears simultaneously). However, this battery must be administered by a specialist in a clinical setting.

This practicum utilized the ITPA auditory closure subtest because of the language base, ease of administration, and definite cut-off point between adequate and discrepant abilities.

Vocabulary Discussion and Statistical Information

PPVT-R is an individually administered, norm-referenced test of verbal comprehension (i.e., heard vocabulary). It is a Standard English test designed for persons 2 years, 6 months to 40 years of age without profound hearing and visual problems. Because the PPVT-R is considered an achievement test, it had to have high content validity. According to the authors, content validity was built into both editions of the test when a complete search was made of Webster's New Collegiate Dictionary for all words whose meaning could be depicted by a picture. Concurrent validity is higher than the original PPVT (Choon & McMahon, 1983). Two types of reliability coefficients were reported in the PPVT-R manual (i.e., internal consistency [split-half] and alternate-forms). Reliability is considered to be moderate to strongly moderate correlation.

This test was chosen because (a) testing was rapid; (b) it required no verbal response; and (c) scoring yielded standard score, age, percentile and/or stanine equivalents.

Memory Discussion and Statistical Information

WJPEB subtest 3, memory for sentences, offered a measurement of

(a) the ability to remember material presented auditorially and (b) the subject's use of sentence meaning to aid recall. Reliability appeared to be low to median between the Psycho-Educational Preschool Study and Denver, Dial, PPVT, and Stanford-Binet tests. Individually, this test yielded a mental age (MA).

Sequencing ability was not tested. This practicum had originally planned to test this area. During pretesting, however, the children appeared to have great difficulty understanding the task involved in the numbers reversed test. Test data reported no reliability statistics for kindergarten children and only low to median reliability for first-grade children. Furthermore, the WJJPEB subtest 10, numbers reversed, was considered to be more of a perceptual reorganizational task than a memory task in contrast to the numbers forward task. This area should be studied when a reliable test instrument is available.

CHAPTER IV

SOLUTION STRATEGY

Possible Alternative Solution

Auditory figure-ground ability (selective listening) is considered one aspect of skill in focusing direction. Lerner (1976) alleged that, until recently, listening as an element of language and as a specific language skill has been neglected. Listening differs from hearing in that hearing is a physiological process that does not involve interpretation. Lerner (1976) continued,

Listening calls for evaluation, acceptance or rejection, internalization, and at times appreciation of the ideas expressed. Listening is the foundation of all language growth, and the child with a deficit in listening skills has a handicap in all communication skills. (p. 221)

Many children, especially young children, do not always realize that they do not understand directions. They may not even question when clarification or repetition is required. They may be reluctant to ask for help. Young children understand the words such as remember or forget but do not automatically apply mnemonic strategies necessary for classroom survival. Other children may not be able to "tune out" extraneous sounds to gain meaning from the speaker's message. This may occur even on a one-to-one basis. Basic concepts and ability to follow directions as well as vocabulary may be reduced.

Schools attempt to overcome this problem by grade retention in hopes that the child will have a better grasp on the basics needed for the higher grade. This offers only an immediate gain. Automatic

promotion is another alternative the schools use. Teachers and principals assume that time will allow these children to "catch up" on missed basics. These children usually fall further and further behind. Cubicles to separate the child from his/her classmates is an option. However, cubicles do not aid reception nor understanding of the speaker's message. Many children do not read directions well and cannot proceed unless help is given even in a cubicle.

Heasley (1980) recommended, "The development of auditory attention and attention span will help the listener to attend to the desired message while ignoring other sounds" (p. 99). Auditory memory is one subskill frequently requiring prescriptive or process training. Two complete programs are directly based on subskills of the ITPA (i.e., Goal Program and MWM Program). Kirk (1982) author of the ITPA, warned that training attention or attention behavior should not be done in the abstract.

Hammill and Larsen (1974) reviewed results of 38 studies which attempted to train children in psycholinguistic skills. These reviews established that specific abilities approach was not particularly successful in improving these specific abilities and, moreover even if successful, had little effect on communication.

One reason may be that abilities overlap and/or interrelate. Wood (1974) desired to study closure and discrimination abilities in children between the ages of 3-5 and 5-5 years. She developed measures which she believed might tap the two processes separately. Using a taped series of familiar sounds, Wood tested (a) three different interruption rates, (b) three interruption durations, and (c) two interruption conditions (i.e, quiet and noise) to produce an

array of different conditions. Final experimental tapes consisted of three types of auditory stimuli: (a) environmental sounds in artificial and playground noise, (b) competing messages, and (c) digit and syllable sequences. Patterns emerged. Sequence retention of digits and syllables [closure task in Wood's opinion] and signal discrimination and closure interaction [closure/discrimination task] were found to correlate with age but neither was related to verbal intelligence, speech articulation, or sex differences. Other discrimination tasks (i.e., signal blending, signal matching, and vowel composition discrimination) were not related to any of the variables. Judgment of relations, emerging from the measures designed to reflect a link between perception and development of basic language concepts, was found to be a correlate of age and verbal intelligence. Wood (1974) concluded that auditory discrimination and closure might represent inseparable tasks for young children.

Auditory training tapes were designed by two post-doctoral students for normal classroom use (Witkin, 1971). Two sets of lessons were developed. Level A for grade two and Level B for grade five and secondary classes. Level A consisted of a tape-recorded screening test and 11 training tapes to follow oral directions under a variety of conditions. Level B tapes and pre- and posttests were similar to Level A except that the tasks were to choose correct words either by writing the word or choosing from multiple choice lists. This auditory training program was field-tested in 16 classes in Alameda County using four grade levels (i.e., second-, fifth-, eighth-, and eleventh-grades) and two socioeconomic levels. Results showed second-grade classes receiving the training improved their

ability to perform auditory perceptual tasks significantly over the control group. Results were nonsignificant for the Level B lessons. Witkin (1971) emphasized that their work demonstrated that attention, vigilance, and selective listening can be improved with practice through a tape-recorded training program given in a regular classroom.

On the basis of the post-doctoral study, a comprehensive program of auditory perceptual training was field-tested in Alameda County under a Title III grant (Witkin, 1971). Results of this study were not cited.

Through a series of studies, Keislar and Stern (1969) found that kindergarten children profited from speaking relevant words aloud. The program consisted of prerecorded magnetic tapes, programmed picture books, and carefully sequenced manipulative games. Conclusions drawn were that vocal labeling aided kindergarten children in solving inferential problems but when more complex thought processes were involved, the training procedure did not help. This practicum concentrated on meaningful material and verbal labeling was just the first step in verbal mediation.

Solution Selected

Children who have essentially normal receptive abilities should, in all probability, be able to learn without complication. However, auditory figure-ground disability as a complicating factor may be overlooked because (a) it is not easily diagnosed and (b) the student appears to understand on a one-to-one basis. Miller and Rohr (1980) questioned why some students with perceptual deficits have academic deficits while others with perceptual deficits show no academic

deficits at all. Their answer was verbal mediation/association as the intervening variable that assists those students who achieve adequately even with identified perceptual deficits.

Ross (1976) stressed the importance of mediation in children who do not spontaneously mediate. He stated the following:

With young children and learning-disabled children who may be functioning at an immature level in terms of selective attention it appears best if one seeks to enhance their attention by modifying the stimuli - such a strategy involves the issue of verbal mediation. (p. 59)

Allington (1975) stated that one critical factor in attending may begin with directing the learner's attention to appropriate featural characteristics. Verbal mediation, used with meaningful tasks in this practicum, was enhanced because the children's attention was focused and the learners were not left to abstract featural characteristics alone.

Verbal mediation was used in following oral directions on auditory training and cassette tapes. Children learned spatial, temporal, classification, color, sequencing, and number concepts. Language does not restructure thoughts according to Olson (1970). Verbal techniques (e.g., rehearsal, rhyming mnemonics, use of pencil and paper) were only a means of extending the functional memory span. However, inner language and receptive language must be known or taught before any child can be expected to mediate the concepts.

This practicum emphasized the stress component of prosody. Key and direction words were produced louder to allow the children to become conscious of the meaning and importance of these words.

This writer has had considerable success alleviating auditory

figure-ground problems in small group settings but only when verbal rehearsal and basic concepts were combined with verbal mediation and nonrehabilitative techniques (e.g., visual cues). This practicum incorporated all techniques into the classroom setting with emphasis based upon prevention rather than remediation.

Early grades were selected because of their importance. Kirk (1982) quoted Benjamin Bloom's data that 50% of intelligence is developed by age 4, 30% between 4 and 8 years, and 20% after 8 years. Kirk supported this citation, "I have the feeling that there is considerable truth in Bloom's statement" (p. 12). By starting in kindergarten and first-grade, children would learn the important words before emotional overlay occurs.

Barr (1976) pointed out that the teacher should know as much as possible about the extent of auditory perceptual problems in educational terms. This practicum stressed auditory closure and figure-ground disability characteristics, possible causes, rehabilitative and nonrehabilitative techniques in an inservice class for the five target teachers.

Rehabilitative techniques were as follows:

1. Verbal referent labeling which aided in building inner language necessary for "tuning out" distracting stimuli;
2. Verbal rehearsal (overt) which allowed children more time for discrimination and/or comprehension and enabled them to hear the message twice (i.e., once from the speaker and again when they repeat it);
3. Verbal mediation (subvocalizing) which established a chain of connections between stimulus and response and acted as a

source for self-stimulation to perform the desired action;

4. Prosody (i.e., stress) ensured comprehension of the message and maintenance of the verbal mediation technique.

Participating teachers were shown these techniques through utilization of Developmental Learning Materials (DLM) Auditory Perception Training tapes (Auditory Imagery Level I, II, III). Temporal concepts (e.g., first, last, before) were taught by a specific method incorporating Auditory Sequencing tapes Level I and through utilization of author-designed cassette tapes and work sheets.

Nonrehabilitative techniques were a compilation of a number of sources (Allington, 1975; Arnold, 1971; Barr, 1976; Clark, 1980; Norman, 1976; Willeford & Billger, 1978) as well as empirical techniques found beneficial by this writer (see Appendix C)

Report of Action Taken

In Simi Valley, speech/language therapists routinely administer the SVUSD speech and/or language screening tests by October to all kindergarten and first-grade children (see Appendix D). This year, the ITPA auditory closure subtest was added to the Berylwood Elementary School test battery. Children receiving a Scaled Score of 29-points or lower on the auditory closure subtest were considered as the target population. Target children were requested to obtain parental approval for additional testing (see Appendix E) to be administered by the author. Auditory closure scores and additional tests (i.e., BTBC, PPVT-R, WJPEB subtest 3) constituted pretest scores.

Problems had begun to surface while preparing for the intervention stage of this practicum. First because of the summer heat,

the sound record scheduled for activity 5 and 6 had warped (see Appendix F, p. 2). Second, the DLM Auditory Sequencing tapes were found to be designed for second-grade students and the concepts, "first" and "last" were never actually taught. Third, the teachers had many commitments which made it difficult to arrange meeting dates for the Teacher Inservice, originally calling for six 1-hour meetings (see Appendix G).

Between October, 1983, through January, 1984, the students were taught by traditional teaching methods. Students were retested on the four test instruments to obtain preintervention scores.

The Teacher Inservice dates had been determined to the satisfaction of all target teachers. Kindergarten teachers would attend one afternoon for 3 hours. First-grade teachers would attend for 3 hours during the morning of the teachers' pupil-free workday occurring between semesters.

Changes had to be made in the activities. The DLM Auditory Training tapes were increased to include Auditory Imagery III for kindergarten students. Auditory Sequencing tapes were reduced to Level I only. Auditory Figure-Ground tapes were not used at all. It was decided to devise training tapes which taught the verbal mediation techniques at the same time concepts were being taught rather than expect the teachers to add more activities to their already heavy teaching day. In this way, all students would learn in a controlled environment.

Author-produced tapes were increased from 0 (see Appendix F) to 23 (see Appendix I). Because intonation (i.e., stress) is of the

greatest importance, this aspect as well as the author's specific method to teach sequencing was "built-into" the tapes (i.e., key and direction words were produced with stress to ensure ease of comprehension).

Each concept taught was presented in a variety of situations. Tapes also specified exactly the concept the listener was to "listen for." Temporal concepts were the main target concepts as these must be learned through the auditory channel.

Other obstacles had to be overcome. Teachers complained that they did not have paper, crayons, nor the time to "run" the dittoes. The PTA generously ordered 50 reams of paper for this practicum. A PTA member also volunteered to "run" the dittoes for the teachers. However, all white ditto paper had been put on back-order by the school warehouse. The principal loaned us two reams to start. Not one sheet of this paper was used by the teachers; nor did the PTA volunteer ever have to run the dittoes. Once teachers realized the merit of the program, the complaining stopped. All five target teachers plan to use these tapes next year and have requested that the activities begin in the fall because they have seen remarkable changes in the students' understanding and behavior.

Communication was constant between the teachers and author. Teachers were surprised at the difficulty the students had with the concepts "before" and "after." Any problem the students were having with concepts were able to be remediated immediately. For example, one of the first-grade classes was unable to accomplish the closure task, activity 3. Training tape, activity 2, was produced.

Another first-grade teacher remarked that her students were

unable to realize "first" when the line started anywhere but from the left. Activity 15 was produced.

In May, 1984, after 3½ months of classes using the practicum program, target students were again tested on the original testing instruments to gain postintervention test scores. Kindergarten teachers were able to use the DLM materials but only 13 author-produced tapes before posttesting began. First-grade teachers completed the DLM materials and 23 author-produced taped and were asking for more. Activities 24 and 25 were produced after posttesting was finished.

CHAPTER V

RESULTS, CONCLUSIONS, AND RECOMMENDATIONS

Presentation and Analysis of Results

Two inservice meetings were scheduled to teach auditory figure-ground disability alleviating techniques because the teacher's time was limited. Participating teachers were two kindergarten teachers and three first-grade teachers. One first-grade teacher had a first/second-grade combination class. These five female teachers were highly experienced with an average of 15 years teaching experience.

Target population were 10 kindergarten children (6 girls and 4 boys), down from the original 14 children, and 19 first-grade students (6 girls and 13 boys), down from 22. One of the target first-graders had been retained. Five children had dropped from the study due to moving or transferring to other programs (i.e., special education and Tri-Counties Regional Center referral). Two of the kindergartners who dropped had been retained. Interestingly, a first-grade student who had transferred to another school was referred to the school nurse by the new teacher. This teacher asked the nurse if the child could hear. This is an indication of the auditory closure or figure-ground disability.

The first Teacher Inservice, a one 3-hour condensed version, was conducted for kindergarten teachers. The second 3-hour inservice was scheduled for February 3, 1984, for first-grade teachers. A few other teachers did attend: one second-grade teacher, an occupational therapist, a substitute teacher whose child has this problem, and the

EH primary teacher. Many others would have attended but target teachers were the main goal and should be given all the attention. Teachers had to be made aware of the importance of the problem in order to undertake the extra work. Teachers, especially experienced teachers, are apt to be reluctant to change their methods of teaching unless they see immediate results. The second-grade teacher has already asked for a list of the basic concepts which the target first-graders missed on postintervention testing. She plans to teach these concepts to her 1984/1985 class.

Each individual attending was given a glossary, agenda (see Appendix H), and management suggestions (see Appendix C). Charts were made delineating (a) symptoms/causes, (b) memory timelines for relevant and irrelevant material, (c) diagram of the method that verbal labeling changes covert mediation into overt mediation and finally into verbal mediation, (d) results of selective listening tasks, (e) definitions of short-term memory vs. long-term memory, and (f) results of verbal mediation.

Important messages stressed were (a) long-term memory (LTM) requires active rehearsal in a number of different sets, (b) what individuals already know will greatly influence how they learn and remember, and (c) language is a means of regulating behavior and cognition.

Before implementation began, teachers were given a schedule of the lessons and activities (see Appendix F). As activities changed, updated lists were distributed. Teachers were able to keep a record of activities finished as sample copies of scripts and worksheets in reduced size (see Figure 1) were on file in the speech/language

office. Final activity list grew to 25 activities (see Appendix I).

Insert Figure 1 about here

Analysis of program results for determination of Terminal Performance Objectives (TPO) were accomplished by a Teacher Questionnaire (see Appendix B) and graphs based upon Campbell's Time-Series Design.

TPO #1 regarding basic spatial and temporal concepts was met. The goal, however, was met primarily by kindergarten students. Of the 29 children in the study, 18 children gained five or more concepts. Kindergartners gained an average of 11.6 concepts; first-graders gained an average of 1.5 concepts. A more objective goal would have been a test of the variations of temporal and spatial concepts (e.g., before, first) to determine if these were known. Time-Series Design revealed a steady climb by kindergartners; first-graders showed more growth in the implementation period (See Figure 2, 3)

Insert Figure 2 about here

TPO #2 concerning auditory closure was remarkable. Graph profiles indicated incredible gain during implementation period for both target grades. There were 24 (82.8%) children, 18 first-grade and 6 kindergarten students, who met or exceeded the target score of

Activity Scripts and Worksheets

Auditory closure training tape
Activity #2



Auditory closure training tape
Activity #2

Today we are going to play a guessing game. Look at your worksheet. You will see pictures of many objects. Put your finger on the picture of each object as I name it. There is a spoon, mouse, fish, star, book, bird, rabbit, lamb, ring, and butterfly.

You will need a black crayon. Take out your black crayon. I am going to say the names of the pictures in a funny way. You must guess what you think I am saying.

Listen. *ird*. Put a black line around the *ird*. I'll give you a hint. It flies. Did you guess that it was a bird?

Listen. *ing*. Put a black line around the *ing*. You can wear it on your finger. Did you guess that it was a ring?

Listen. *ook*. Put a black line around the *ook*. I hope you put a black line around the book.

Listen. *ouse*. Put a black line around the *ouse*. Did you guess that the answer was mouse?

Listen. Here is a hard one! utter *i*. Put a black line around the utter *i*. Did you guess butterfly?

Listen. *oon*. Put a black line around the *oon*. You were right if you put a black line around the spoon.

Listen. *ish*. Put a black line around the *ish*. You were right if you put a black line around the fish.

Listen. *ar*. Put a black line around the *ar*. You were right if you put a black line around the star.

THIS IS THE END OF YOUR LESSON. WERE YOU A GOOD GUESSER?

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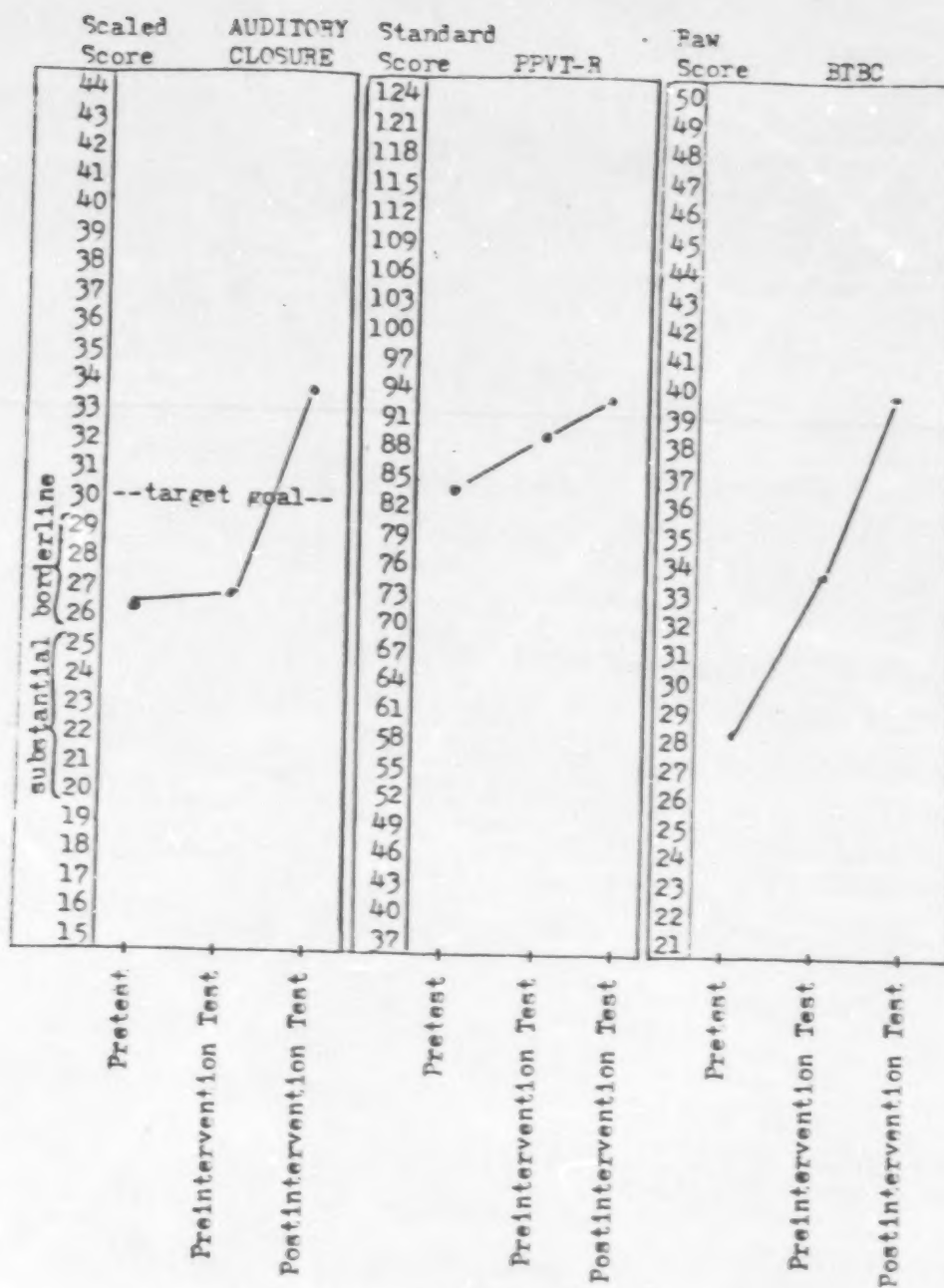


Figure 2. Mean growth of kindergarten students.

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SS 30-points. The only first-grade student who did not meet the target score was a male who had difficulty repeating during pretesting. He gained SS 7-points by postintervention testing. Three kindergartners missed the target goal by only SS 1-point. Two of these children were bilingual. It must be noted that kindergarten teachers were not able to teach the complete program.

Auditory closure graph timeline (see Figure 2) disclosed a SS .4-point average gain for kindergarten children between pretest and preintervention. Postintervention scores exhibited SS 6.8-point average gain. This was a difference of SS 6.2-point average gain due to the program. First-grade scores were also impressive. Gain achieved during pretest and preintervention was an average of SS 2.5-points; whereas gain achieved between preintervention and postintervention was an average of SS 7.8-points (see Figure 3). Gain accomplished by the program was an average of SS 5.3-points. Both grades demonstrated highly significant changes.

Insert Figure 3 about here

One unanticipated event occurred during preintervention testing. It was discovered that AC preintervention scores had decreased for 6 of the 12 kindergartners and 9 of the 13 first-grade students during the period where only traditional teaching took place. Until this time, it was not realized that AC scores would decrease for any reason but an age factor. It is significant that not one child's score decreased during intervention.

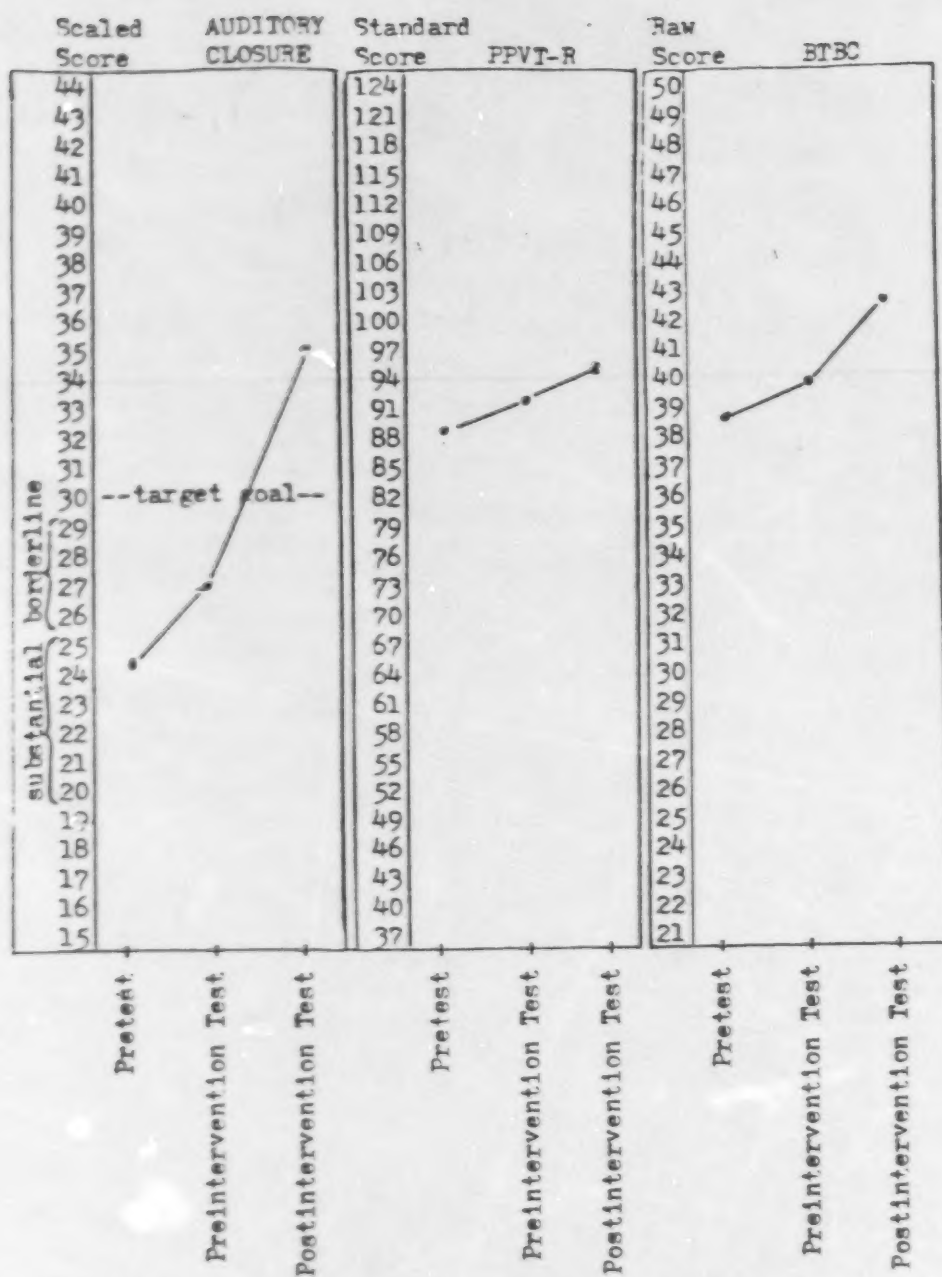


Figure 3. Mean growth of first-grade students.

Vocabulary was one area which did not present unusual growth. TPO #3 called for 60% of the children to increase their standard scores on the PPVT-R by 3-points. Kindergarten children (60%) did increase their vocabulary scores to meet the goal but only 57.9% of the first-grade students met the 3-point average, thereby missing the goal by 2.1%. Chart timeline confirmed steady growth but no significant change (see Figures 2, 3).

It was anticipated that memory for sentences (content) would not show a major change because memory is not a physiological quality. However, according to Figure 4, a sharp increase in the graph profile of memory for sentences was recorded by first-grade children during the intervention period. This may indicate that these children are gaining in their listening attention ability.

Insert Figure 4 about here

TQ Part II, questions #1 through #10, assessed the Teacher In-service, TPO #4 through #7. Objectives had been exceeded even though the primary attention had shifted from teacher techniques to the tapes. This shift was created by the decreased time the teachers were able to allot to the inservice. A more realistic evaluation of the inservice may have been gathered had the interval between the inservice and evaluation been shorter (see Appendix J).

Questions #11 through #15 assessed children's performance, TPO #8. First-grade teachers stated 100% positive change. Kindergarten teachers did not keep records specifically concerning these tasks. All five teachers reported significant improvement in the students'

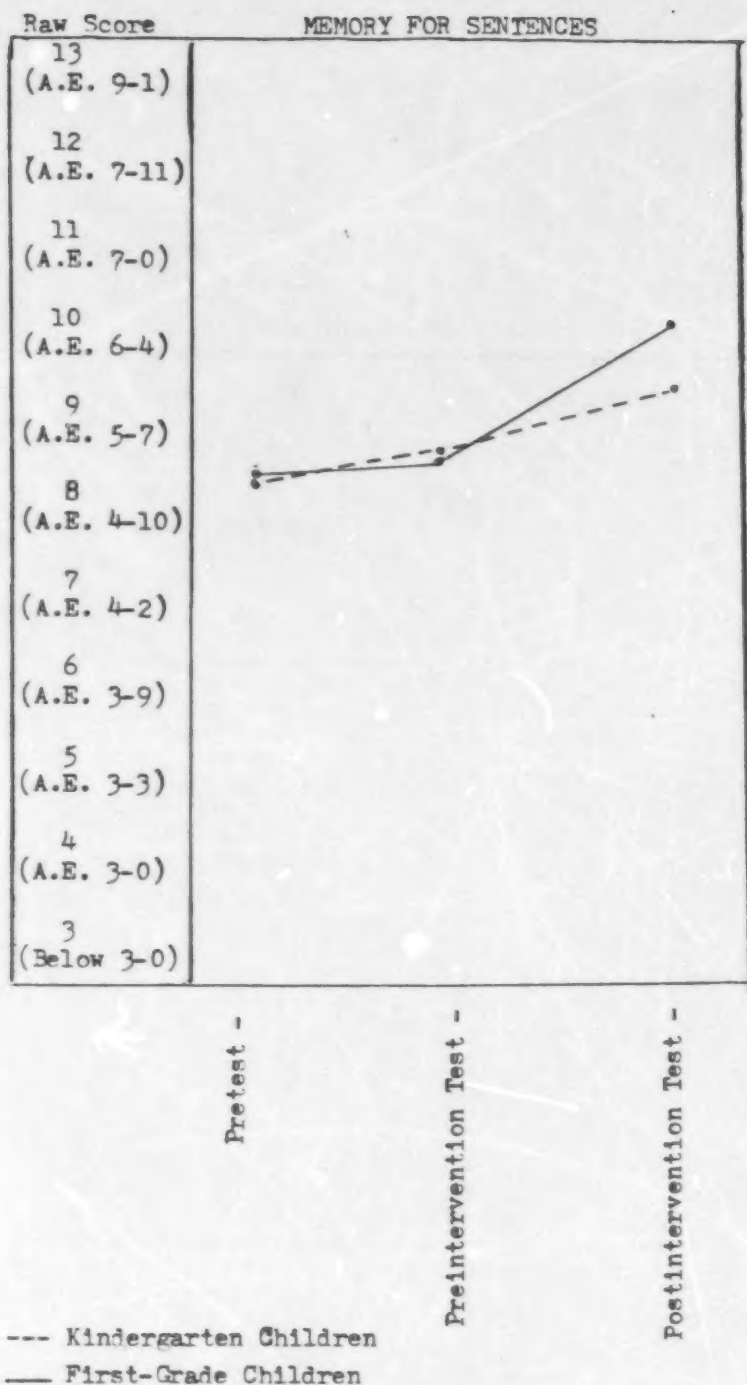


Figure 4. Comparison of mean memory for sentences raw scores for kindergarten and first-grade children.

attending skills. This would have been a more valid question.

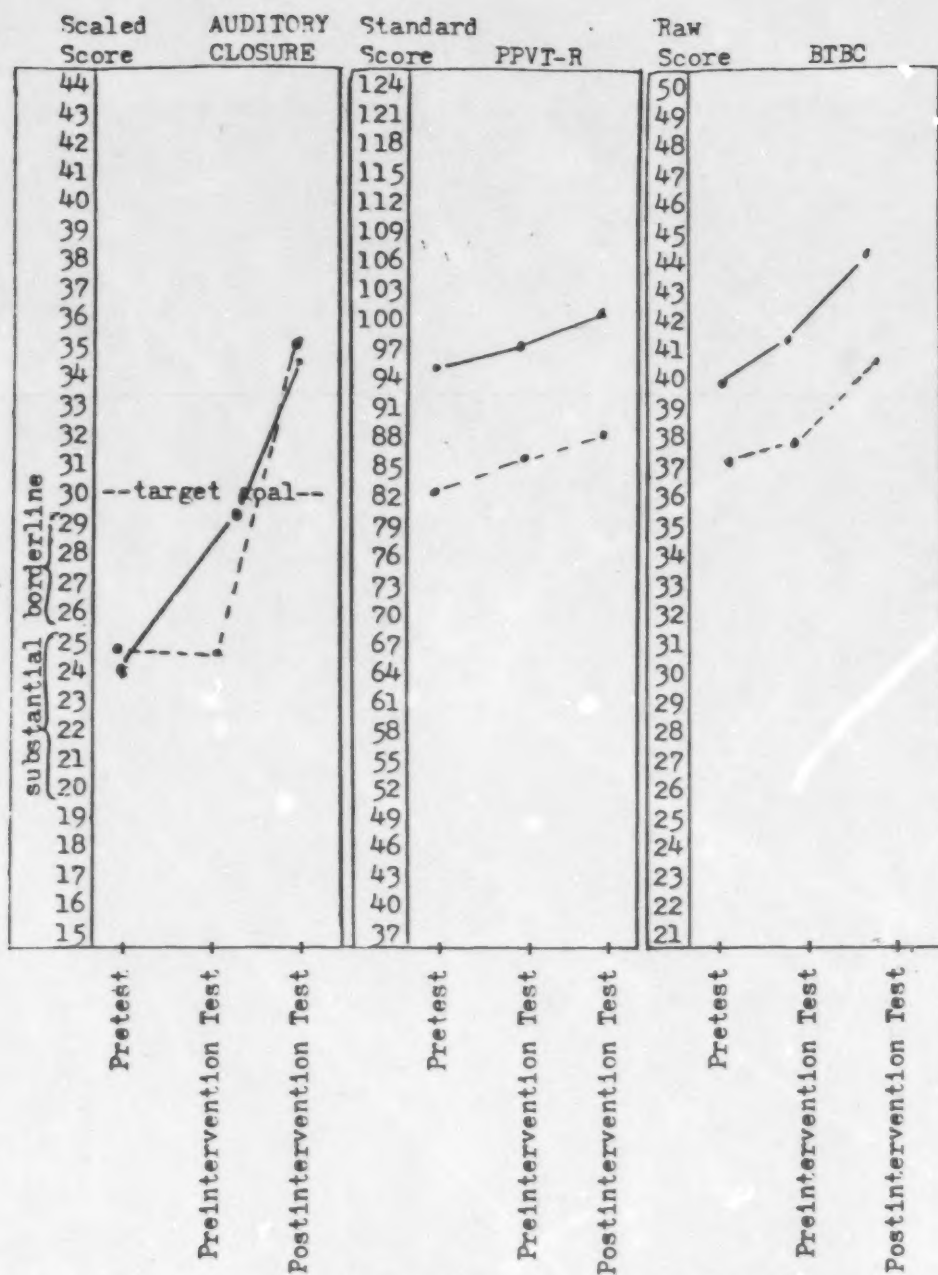
Although TQ Part III was designed for informational purposes, these questions were extremely valuable. Every teacher wanted the program continued. Interestingly, not all cared that other teachers be informed about it (see Appendix J).

Berylwood School was eligible for additional funds because of its socioeconomical level. Chapter I teachers aided designated students in the first- through sixth-grade. Figure 5 compared the mean performance scores between the 9 target first-graders attending and 10 target first-graders not attending Chapter I. Graph indicated that those not eligible manifested a higher vocabulary, more basic concepts, and appeared to increase steadily in the auditory closure skill; whereas those attending Chapter I displayed lower vocabulary, fewer basic concepts, and showed a slight decrease before a sharp increase to eventually achieve a higher auditory closure score. A closer examination of individual charts (not illustrated) revealed that low scores were not representative of all children attending Chapter I.

Insert Figure 5 about here

Conclusions

Teacher enthusiasm and student interest in the program were extraordinary. Teachers found they discovered immediately the children having difficulty with a particular concept and could correct them before incorrect learning took place. Until this time,



---- First-grade children attending Chapter I (nine students).
 — First-grade children not attending Chapter I (10 students).

Figure 5. Comparison of the mean performance scores for first-grade children attending and not attending Chapter I.

children were routinely taught temporal concepts through the visual modality using pencil/paper tasks. The children's classroom behavior while using "before/after" and sequencing tapes supported the contention that temporal concepts must be taught through the auditory channel for complete comprehension.

Surprisingly, many early spatial concepts were either unknown or had been learned incorrectly by the children. Through the use of tapes, the teachers were able to move freely around the room to ensure that all concepts were being learned correctly. The concept "from" a particular object was discovered to be a difficult concept and required many variations to gain total understanding.

Closure tasks were found to be quite perplexing for the first-grade class containing 11 target students. Children could not guess names of objects when sounds were deleted even though pictures of the objects were directly before them. Activity 2 was devised as a training tape and subsequently used in kindergarten. After using Activity 2, this first-grade class was able to accomplish the closure task and the teacher requested more of these activities. Other teachers reported their students enjoyed these activities immensely.

Many unexpected benefits occurred. One of the first-grade teachers noticed a student who had been having a great deal of difficulty begin to read. This would support Vlietstra's 1982 findings that a shift from color preference to shape (form) preceeds reading.

Children learned that they couldn't anticipate directions but had to wait until the complete statement was heard before they could accomplish the task.

Another benefit resulted in the classrooms being cleaner than

usual. Before the program, whenever a crayon was dropped, it was not retrieved. Now, all students immediately grabbed for it. This was proof that students considered these activities to be fun projects. It is planned to utilize this program next year. Different versions are being drawn for the two grades to keep it interesting and to add two more concepts for the first-grade students. Teachers have suggested a check-out file for tapes to ensure easy access.

This practicum resolved many issues. Success reinforced the premise that verbal mediation is easily and quickly taught to young children. Teachers had to model verbal mediation only three or four times in the beginning. After that, a single reminder sufficed.

It had been this writer's contention that auditory closure weakness accompanied by a short auditory memory created auditory figure-ground confusion. Results of this practicum did not confirm correlation between vocabulary, memory ability for sentences, or auditory closure ability (see Appendix 5). Determination of a correlation between memory for sequencing and auditory closure would have to be conducted before a definite answer could be reached. Conclusion of this practicum was that auditory closure is indeed a specific skill or ability based upon a language component and dependent upon the ability/inability to mediate.

Recommendations

Results of the implementation were positive. In light of the goals and objectives having been met and the enthusiastic response of teachers and students, it is highly recommended that this program be initiated into every kindergarten and first-grade class. Children

who know how to mediate and comprehend basic words can overcome the auditory figure-ground disability and should, in all probability, never require special help.

It is not advisable to use the mediating technique without the tapes. Tapes were specifically designed to teach (a) verbal mediation, (b) basic direction words, and (c) temporal concepts. An important benefit derived from use of these tapes was aiding children to shift their focus of salient features. Even though teachers credit the tapes for the success of this program, their knowledge and modeling of the verbal mediation technique should be considered vital factors.

Dissemination

Berylwood teachers have become aware of the auditory figure-ground disability problem and the program designed to remediate it. Other teachers are now requesting implementation into their schools in Simi Valley. A grant was written and presented to Dr. Howe, Director of Instructional Operations, to initiate this program throughout the 19 elementary schools in Simi Valley. Dr. Howe has already asked for a manual to be written.

Auditory Closure: The ability to fill-in missing gaps when the whole word, phrase, or sentence is not heard.

Auditory discrimination: Ability to recognize a difference between phonemes (sound families).

Auditory Figure-Ground: Selective listening ability in that the important message must be extracted from the sounds in the environment.

Auditory memory for content: Ability to recognize elements in an auditory event without regard for sequencing of those elements.

Auditory for sequencing: Ability to remember order of a set of elements in an auditory event and/or ability to recall a rhythmic pattern.

Inner Speech: Relates to the integration and organization of sensory and perceptual experiences the individual is continuously encountering.

Language: Synthesis of phonology, semantics, and syntax.

Mediational deficiency: General characteristic of the young child's apparent failure to produce the appropriate word or phrase and then fails to stimulate any subsequent adaptive response.

Mediation theory: Theory that stimuli do not directly initiate behavior but rather activate intervening processes that initiate behavior.

Metacognition: Knowledge concerning one's own cognitive system as well as that of others.

Metalinguistic function: Function wherein language itself becomes an object of knowledge.

Metamemory: Child's verbalizable knowledge of how certain classes of variables act and interact with one another to affect the quality of an individual's performance on a retrieval problem.

Mnemonic strategies: Critical factors for retention and transfer from primary memory to secondary memory.

Phonology: Sounds and their composites (words and sentences) and their relationship to articulation.

Production deficiency: Child has the prerequisite ability for adopting a particular mnemonic strategy but does not do so spontaneously.

Prosody: Factor which tells the listener which words deserve attention; intonation.

Selective attention: State in which the individual becomes set to select and respond to a specific pattern of stimuli or to one situation to the exclusion of others (Berry & Eisenson, 1956).

Semantics: Meaning of words, i.e., vocabulary skills. Every word contains a concept. A word includes many variations of an idea. Most words have more than one meaning.

Syntax: Order and interrelationship of words that give meaning to communication. For example, "mountain the hiked in up they the sun-shine" is meaningless even though each word is meaningful. If the student understands syntax, s/he is able to answer questions that begin with a "what," "where," "when," "why," and "how."

Verbal rehearsal: Process by which the subject continually presents information to himself/herself. In addition to maintaining information in primary memory, rehearsal also serves the function of transferring information to secondary memory, a more stable, permanent store of much greater capacity (Hagen, 1975).

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APPENDIX A
TELEVISION VIEWING RESPONSES FROM PARENTS OF
KINDERGARTEN, FIRST-, SECOND -, AND THIRD-GRADE STUDENTS

Television Viewing Responses from Parents of
Kindergarten, First-, Second-, and Third-Grade Students

Question	Grade			
	66 ^K (31) ^a	67 ¹ (17) ^a	83 ² (32) ^a	52 ³ (18) ^a
#7 How many hours a day would you estimate that your child watches TV?				
1 - 2 hours	51.6%	29.4%	50.0%	16.7%
2 - 3 hours	29.1%	52.9%	40.6%	44.4%
3 - 4 hours	16.1%	17.7%	0	27.8%
4 - 5 hours	3.2%	0	9.4%	11.1%
5 or more hours	0	0	0	0
#8 Are there certain programs your child is not allowed to watch?				
yes	83.9%	70.6%	81.2%	72.2%
no	16.1%	29.4%	18.8%	27.8%
#9 Do you set limits on the amount of time your child is allowed to watch television?				
yes	61.3%	64.7%	53.1%	61.1%
no	38.7%	35.3%	46.9%	38.9%
#10 Do you watch television with your child?				
yes	87.1%	82.4%	93.8%	77.8%
no	6.5%	0	3.1%	5.5%
sometimes	6.4%	17.6%	3.1%	16.7%
#11 Do you discuss the program content with your child?				
yes	71.0%	53.0%	53.1%	66.7%
no	16.1%	23.5%	37.5%	22.2%
sometimes	12.9%	23.5%	9.4%	11.1%
#12 What types of program does your child prefer to watch?				
Cartoons	36.7%	36.9%	28.2%	28.9%
Situational comedies	24.0%	26.1%	20.0%	19.2%
Comedy-Variety	19.0%	10.9%		15.4%
Adventure-drama	11.4%	15.2%	18.8%	17.3%
Movies	8.9%	10.9%	16.5%	19.2%
Game shows			16.5%	

Note.

^a Number of students in each grade level. Numbers in parentheses indicate the number of responses returned.

APPENDIX B
TEACHER INSERVICE QUESTIONNAIRE-
EVALUATION OF TECHNIQUES TO ALLEVIATE
AUDITORY FIGURE-GROUND DISABILITY

Teacher Questionnaire

Dear Teacher,

The goal of this inservice was to provide you with management techniques for alleviation of auditory figure-ground disability. In order to determine the effectiveness of this inservice, please answer the following questions.

Part I

Scoring:	Significant (4)	Moderate (3)	Slight (2)	None (1)
Question	Amount			
1. Inservice provided an understanding of the rehabilitative technique to build inner language, i.e., referent labeling?	4	3	2	1
2. Inservice provided background knowledge of characteristics of auditory figure-ground disability?	4	3	2	1
3. Inservice provided information about possible causes and interrelationships of perceptual abilities?	4	3	2	1
4. Inservice provided adequate definitions of auditory closure and auditory figure-ground abilities and disabilities?	4	3	2	1
5. Inservice provided an understanding of rehabilitative techniques of verbal rehearsal, mediation, visual cues, etc.?	4	3	2	1
6. Inservice provided understanding of prosodical methods of instruction in verbal mediation?	4	3	2	1
7. Inservice allotted adequate time to learn verbal rehearsal, mediation, prosody, visual cues importance, etc.?	4	3	2	1
8. Inservice provided "hands-on" experience using verbal mediation techniques?	4	3	2	1

- | | | | | |
|--|---|---|---|---|
| 9. Inservice provided methods, ideas, suggestions to alleviate auditory figure-ground disability and which could be applied to other daily activities? | 4 | 3 | 2 | 1 |
| 10. Inservice provided list of classroom management suggestions to alleviate auditory figure-ground disability | 4 | 3 | 2 | 1 |

Part II. Please answer the following questions regarding the target students in your classroom:

- | Scoring: | Significant (4) | Moderate (3) | Slight (2) | None (1) |
|--|-----------------|--------------|------------|----------|
| 11. Change in student's attentive behavior, i.e., less distractibility, restlessness, confusion, etc., as judged by teacher's opinion. | 4 | 3 | 2 | 1 |
| 12. Actual change in children's ability to follow directions and/or comprehend as shown by paperwork? | 4 | 3 | 2 | 1 |
| 13. Change in number of tasks accomplished by the children as shown by teacher's records? | 4 | 3 | 2 | 1 |
| 14. Change in understanding of temporal sequencing, i.e., first, last, before, after, etc., as shown by teacher's records? | 4 | 3 | 2 | 1 |
| 15. Change in understanding of spatial concepts as shown by teacher's records? | 4 | 3 | 2 | 1 |

Part III. Please indicate your opinion of the following questions.

- | | <u>Yes</u> | <u>No</u> | <u>No</u>
<u>Opinion</u> |
|---|------------|-----------|-----------------------------|
| 16. Did the inservice provide useful and needed knowledge of this problem? | () | () | () |
| 17. Would you recommend this inservice be offered to other teachers? | () | () | () |
| 18. Would you utilize the method of verbal mediation in your classroom in the future? | () | () | () |

Thank you.

APPENDIX C
MANAGEMENT SUGGESTIONS FOR THE CLASSROOM TEACHER

Management Suggestions

1. Awareness of sound and no sound. Listen and label all sounds in the classroom, e.g., fluorescent lights, air conditioning, desks being moved, feet shuffling, bells, etc. Labeling allows the student to "tune out" the sounds.
2. Awareness of voice dynamics. Note different speaking voices, i.e., male and female, loudness, location, etc. Discuss the mood of the speaker and how it is reflected by the tone of the voice as well as the words used.
3. Instructions. Speaker should use good inflection and speak at a comfortably loud volume. Alter the inflection, pitch, speaking rate, and volume of your voice to emphasize key words and emotional content of the verbal message. No exaggeration of lips or facial movements. Gestures may be used freely unless they distract.
4. Obtain student's undivided attention. Use a sound carrier, e.g., "listen" or lightly touch the shoulder when teaching new concepts or giving instructions.
5. Instructional transitions. Move into new instructional topics gradually. Briefly review past material. Use words within the student's vocabulary, defining new terms as necessary. Isolate key words. New information should be separated into small, well-defined segments. Avoid multiple commands or directions and detailed instructions.
6. Check comprehension. Be sure the student understands the words used. Repeat instructions on an individual basis if necessary. Child should be asked to repeat instructions rather than reply whether the instructions were understood or not. Rephrase

when repetition does not work.

7. Periodic feedback. This feedback will ensure that the child is listening to the speech message. Such practice may also enhance listening habits. Teacher may ask short, simple questions and have the student repeat the question as part of the answer.
8. Auditory exhaustion. Watch for signs of decreased concentration, attention, and understanding. Plan more difficult lessons during the early part of the school day or alternating lessons that require greater auditory attention with more frequent individual study periods.
9. Reduce distractions. Extraneous noises and visual distractions should be avoided, especially when teaching new concepts or giving instructions.
10. Preferential seating. Seating away from air conditioners, pencil sharpeners, and doorways should be provided. Teacher should allow student to experiment with various seating arrangements to determine the most beneficial location. Seating with the strong ear toward the speaker is helpful.
11. Visual cues. Having the student "watch the speaker's lips" is a psychological cue but one which works.
12. Visual aids. Overhead or opaque projectors, pictures, blackboards, or slides may be useful to present supplementary visual summaries of oral discussions and presentations.
13. Auditory Imagery. Tell what seems to be happening by picturing it in the "mind's eye." Infer qualities by using all senses other than visual. Children can interpret the action of a story

(word picture) with various body movements. Stories told or read to the children and then have them draw what they "visualize" is helpful. Ability to visualize and interpret an image from an auditory description should be stressed.

14. Listening games and activities. "Simon Says" is still one of the best. Square dance instructions are excellent as are rhythm games, discrimination, sequencing, and memory activities.
15. Subvocalizing or verbal rehearsal. Allow and encourage the child to repeat instructions in order to hear the message twice. It also enables the student to "hold" the syllables longer to allow for discrimination and/or comprehension of the message. Subvocalization in reading was also recommended until the student is able to eliminate the behavior.
16. Verbal mediation. Teach the child to give directions to himself/herself, i.e., naming, verbal associations, and putting stimuli into a verbal context.
17. Reinforcement. An opportunity to apply newly acquired knowledge in a situation is necessary.
18. Assignments. An assignment book may also be a helpful tool. New concepts of information can be complemented by providing reading material at the individual level if possible.
19. Phonics. Visual cues (colors, underlined letters) should be used to aid the child in relating a specific phoneme to a visual stimulus. Emphasize differences in the phonemes of the language by having the student repeat the sounds and listen to them, not only as the speaker says them but also as the student says them.

20. Parents. Memory is best for real-life events or occurrences.

Parents can help supplement academic if a coordinated liaison can be established between home and school. Labeling should be constantly initiated by the parent, i.e., clothing, furniture colors, shapes, feelings, toys, food, transportation, etc.

Auditory imagery can be reinforced at home. Parents can turn off the television media and ask children to describe the action based on what has been heard or talk about the event content of unseen background sounds.

APPENDIX D
KINDERGARTEN AND FIRST-GRADE SCREENING
NOTIFICATION LETTER TO PARENTS

SIMI VALLEY UNIFIED SCHOOL DISTRICT
875 E. Cochran Street
Simi Valley, California

September

Dear Parents:

As part of the educational services offered by the Simi Valley Unified School District, all Kindergarten and 1st grade students throughout the district will be screened for speech and language problems. In addition, any upper level students referred for screening by classroom teachers will also be evaluated.

Screening procedures will be undertaken at the beginning of the school year by the Speech & Language Therapist assigned to your child's school. If your child is identified as having an articulation and/or other language problems which warrant enrollment in the Speech & Language Program you will be so notified at a later date.

If you have any questions regarding this matter please feel free to contact the Speech & Language Therapist at your school.

Sincerely,

SPEECH & LANGUAGE THERAPY DEPARTMENT

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APPENDIX E
PARENT APPROVAL LETTER TO TEST TARGET STUDENTS

SIMI VALLEY UNIFIED SCHOOL DISTRICT

Dear Parent:

In order to plan thoroughly for your child's educational needs it is important that a complete evaluation be made of strengths and weaknesses in the area of articulation and language. If you wish to have a conference regarding the test results please contact me.

Thank you for your cooperation. It is our pleasure to be able to provide this additional educational service for you.

Sincerely,

Speech and Language Therapist

School

Address

Please sign the form in the space below and return it to the above school address if you wish to have this assessment.

RELEASE FOR EVALUATION

Re: _____ Grade: _____

Birthdate: _____ Age: _____

School of Attendance: _____

I am interested in my child's educational needs. I will be glad to have my child participate in the evaluation which includes articulation and language.

Parent's Signature

Son () Daughter ()

Date

APPENDIX F
INITIAL LESSON AND ACTIVITY SCHEDULE

APPENDIX F
LESSON SCHEDULE

Room #k-1 Kindergarten	Room #k-3 K/1 Comb.	Room #204 1st Grade	Room #205 1st Grade	Room #201 1/2 Comb.
Activity 1 ^a	Activity 1 ^a	Activity 1 ^a	Activity 1 ^a	Activity 1 ^a
Auditory Perception and Discrimination: City, Farm, & Home sounds (6 lessons)	Auditory Imagery I ^b (6 lessons)	Auditory Figure-Ground ^b Level I (6 lessons)	Auditory Imagery I ^b (6 lessons)	Auditory Figure-Ground ^b Level I (6 lessons)
Auditory Imagery I ^b (6 lessons)	Auditory Perception and Discrimination: City, Farm, & Home sounds (6 lessons)	Auditory Imagery I ^b (6 lessons)	Auditory Figure-Ground ^b Level I (6 lessons)	Auditory Perception and Discrimination: City, Farm, and Home sounds (6 lessons)
Auditory Perception and Discrimination: Background Noise (3 lessons)	Auditory Figure-Ground ^b Level I (6 lessons)	Auditory Memory ^b for Sequencing I (9 lessons)	Auditory Imagery ^b II (6 lessons)	Auditory Memory ^b for Sequencing ^b I (9 lessons)
Auditory Figure-Ground ^b Level I (6 lessons)	Auditory Imagery ^b II (6 lessons)	Auditory Perception and Discrimination: City, Farm, and Home sounds (6 lessons)	Auditory Perception and Discrimination: City, Farm, and Home sounds (6 lessons)	Auditory Imagery ^b I (6 lessons)
Auditory Imagery ^b II (6 lessons)	Auditory Memory for Sequencing ^b I (9 lessons)	Auditory Imagery ^b II (6 lessons)	Auditory Memory for Sequencing ^b I (9 lessons)	Auditory Figure-Ground ^b Level II (4 lessons)
Auditory Imagery ^b III (6 lessons)	Auditory Figure-Ground ^b Level II (4 lessons)	Auditory Imagery ^b III (6 lessons)	Auditory Memory for Sequencing ^b I (9 lessons)	Auditory Imagery ^b II (6 lessons)
Auditory Sequencing ^b I (9 lessons)	Auditory Imagery ^b III (6 lessons)	Auditory Perception and Discrimination: Background Noises (3 lessons)	Auditory Sequencing ^b Level II (10 lessons)	Auditory Memory ^b for Sequencing II (10 lessons)
Activities: 2,3,4,5,6,7,8,9,10,11,12 ^a	Activities: 2,3,4,5,6,7,8,9,10,11,12 ^a	Auditory Sequencing ^b Level II (10 lessons)	Activities: 2,5,6,4,3,7,8,9,10,11,12 ^a	Auditory Perception and Discrimination: Background Noises (3 lessons)
Auditory Sequencing ^b II (10 lessons)	Auditory Sequencing ^b II (10 lessons)	Auditory Figure-Ground ^b Level II (4 lessons)	Auditory Perception and Discrimination: Background Noises (3 lessons)	Auditory Imagery ^b III (6 lessons)
Auditory Figure-Ground ^b Level II (4 lessons)	Auditory Perception and Discrimination: Background Noises (3 lessons)	Activities: 2,5,6,4,3,7,8,9,10,11,12 ^a	Auditory Figure-Ground ^b II (4 lessons)	Activities: 2,3,4,5,6,7,8,9,10,11,12 ^a

^a See page 2 for Description of activities 1 through 12.

^b Developmental Learning Materials

Activity Description

- Activity 1 - Discussion of sounds in room to be labeled and "tuned-out," e.g., fluorescent lights, outside sounds, adjoining room sounds, etc.
- Activity 2 - Choric speaking - "prosodic" meanings explained and variations of the speaker's voice, i.e., soft voice, loud voice, etc.
- Activity 3 - "Before - after" carrier phrase worksheets
- Activity 4 - Auditory discrimination training tape of sounds in the environment and accompanying pictures.
- Activity 5 - Follow Through With Sound/Indoor-Outdoor (Knowledge Aid, Morton Grove, Illinois, 60053)
- Activity 6 - Follow Through With Sound/Indoor-Outdoor (Knowledge Aid, Morton Grove, Illinois, 60053)
- Activity 7 - "Opposite" and "Belongs with" carrier phrases worksheets
- Activity 8 - Touching Time worksheets
- Activity 9 - Understanding Our Feelings pictures with worksheets for follow-through activities. #1215 Instructor Corp., Paoli, Ia.
- Activity 10- "In the Looking Glass" poem by Louise Binder Scott

IN THE LOOKING GLASS

I see my face in the looking glass,
When I look, look, look
In the looking glass.
I look at my hair,
And I see my ears there,
On the left and the right,
For I have a pair
In the look-look-looking glass!

I see my face in the looking glass,
When I look, look, look
In the looking glass.
I see two round eyes
That are full of surprise,
One left and one right,
And bluer than skies
In the look-look-looking glass!

I see my face in the looking glass,
When I look, look, look
In the looking glass.
I see a small nose,
And I see my chin,
And I see a red mouth
Where the food goes in,
In the look-look-looking glass!

I see my face in the looking glass,
When I look, look, look
In the looking glass.
Sometimes I smile,
And sometimes I frown,
But a smile is a frown
Turned upside down
In the look-look-looking glass!

Louise Binder Scott
from Talking Time

Emphasize body parts, opposites, functions
to be used with Feeling Labels.

- Activity 11- Additional before-after carrier phrase worksheets
- Activity 12- Body parts naming

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APPENDIX G
TEACHER INSERVICE OUTLINE

TEACHER INSERVICE OUTLINE

- 1st Meeting - Background of problem will be reported and expanded glossary will be given to participants.
- 2nd Meeting - Problem areas and importance of alleviation will be discussed. Rehabilitative and nonrehabilitative techniques will be described. Management Suggestions for the Classroom Teacher (Appendix D) to be presented for future reference.
- 3rd Meeting - Auditory Perception Imagery tape will be used to demonstrate verbal labeling, rehearsal, and mediation rehabilitative techniques in "hands-on" practice session. Teachers are to be told that children and teacher repeat each direction. In this way, children hear the direction twice, once from the tape and once from themselves. Children are to hold up their papers after each picture is completed so that (1) immediate feedback is received, and (2) children obtain correct internalization. Teacher will repeat direction as the incorrect response is being changed (This is a teaching situation, not a test).
- 4th Meeting - Method to "tune out" extraneous stimuli will be illustrated using Auditory Figure-Ground tape. Children are told to listen to the background stimuli during introduction. In this manner, these sounds are able to be "tuned out." Children are then instructed to listen for the "target voice" and not background sounds. Each teacher will practice method.

5th Meeting - Sequencing procedure to enhance learning will be described at this session. First row on each worksheet is to be repeated by teacher and children at a normal teaching voice level. Teacher should begin to "fade out" during the next rows by using a softer voice level. At first the tape is stopped after each number and children mark the number on the picture in order of presentation. Children who need to number should use this aid until they feel comfortable enough to "keep the numbers in their mind." There is no correction at this stage, the children are instructed to proceed with the following row even if they missed the instruction.

6th Meeting - Carrier phrases, e.g., before and after; important words, i.e., color, direction, etc.; and prosody, i.e., intonation patterns, and vocal variations will be discussed at this session. Flannel board stories, e.g., Three Billy Goats Gruff, Goldilocks and the Three Bears, etc., are examples of question - answer prosody as well as an excellent source of vocal variations. A comparison could be made of the deep, gruff voice of Papa Bear; soft voice of Mama Bear; high, sad, whiny, or excited voice of Baby Bear; and Goldilock's high, sweet voice. Children could be asked to determine "who" might have said "Who's been sleeping in my bed?"

Vocal variations of happy, sad, tired or weary, sick or ill, angry, loud or soft, slow or fast, etc., are to be compared when Understanding Our Feelings pictures are scheduled (see Appendix K). Lesson schedule for each room was designed to allow material to be distributed among

five classrooms when only one or two kits are available.

Teachers are to be informed that children must produce variations to ensure internalization. Worksheets to accompany activities (see page 2) are author-produced.

APPENDIX H
TEACHER INSERVICE AGENDA

AGENDA

- I. Introduction
- II Symptoms and possible causes
- III Background information
 - A. Basic considerations of auditory processing
 - B. Memory
 - C. Mnemonic strategies - critical factors
 - D. Selective attention
 - 1. Relevant variables (teacher)
 - 2. Knowledge of variables (children)
 - E. Prosody
 - F. Auditory closure
 - G. Auditory figure-ground (Listening in noise)
 - H. Inner language
- IV Rehabilitative and nonrehabilitative techniques
- V Auditory imagery tapes (Instruction tape)
- VI Auditory figure-ground tapes
- VII Auditory sequencing tapes
- VIII Before - after, first-last, etc. tapes

APPENDIX I
FINAL LESSON AND ACTIVITY SCHEDULE

LESSON AND ACTIVITY SCHEDULE

Activity Description

- Activity 1 - discussion of sounds in room to be labeled and "tuned-out," e.g., fluorescent lights, air conditioning, heating unit, outside sounds, adjoining room sounds, etc.
- Activity 2 - Auditory closure training tape
- Activity 3 - Auditory closure task - guessing activity (Training tape)
- Activity 4 - Auditory closure task - guessing activity (Multi-syllables)
- Activity 5 - Auditory discrimination training tapes of sounds in the environment and accompanying pictures to be labeled (no follow-up activities).
- Activity 6 - Auditory training tape - verbal rehearsal and verbal mediation to be used before auditory imagery tapes.

Auditory Imagery tapes^a (Level I, II, III 6 lessons each) are to be used after Activity 6 training tape.

- Activity 7 - "Before" training tape
- Activity 8 - "After" training tape
- Activity 9 - Before - After practice tapes (mother and baby animals)
- Activity 10 - Before - After practice tapes (objects)
- Activity 11 - Before - After practice tapes (objects)
- Activity 12 - Before - After practice tapes (objects)
- Activity 13 - Before - After practice tapes (objects)
- Activity 14 - "First" training tape to be used before auditory sequencing memory tapes. (verbal sequencing)
- Activity 15 - "First" - "last" training tapes to be used before auditory sequencing memory tapes. (position sequencing)

Auditory Memory tapes^a (Level I, 9 lessons) are to be used after Activity 14 and Activity 15 training tapes.

- Activity 16 - "From" training tape to be used after auditory memory tapes.
- Activity 17 - "From" practice tape to be used after auditory memory tapes.
- Activity 18 - Before - After concept using number sequencing to six.
- Activity 19 - Before - After concept practice tape using number sequencing.
- Activity 20 - Auditory closure task^b - guessing activity (Food category).
- Activity 21 - Auditory closure task^b - guessing activity (Animal category).
- Activity 22 - Auditory closure task^b - guessing activity (Clothing category).
- Activity 23 - Auditory closure task^b - guessing activity (Toys category).
- Activity 24 - "not the first or the last" (training tape)
- Activity 25 - "not the first or the last" (practice tape)

^a Developmental Learning Materials

^b Adapted from Auditory Closure Cards by Ideal School Supply Company, Oak Lawn, Illinois, 60453

APPENDIX J
TEACHER INSERVICE QUESTIONNAIRE RESPONSES

Teacher Questionnaire

Dear Teacher,

The goal of this inservice was to provide you with management techniques for alleviation of auditory figure-ground disability. In order to determine the effectiveness of this inservice, please answer the following questions.

Part I

Scoring: Significant (4) Moderate (3) Slight (2) None (1)					
<u>Question</u>		<u>Amount</u>			
		<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>
1.	Inservice provided an understanding of the rehabilitative technique to build inner language, i.e., referent labeling?	1	2	2	
2.	Inservice provided background knowledge of characteristics of auditory figure-ground disability?	1	2	2	
3.	Inservice provided information about possible causes and interrelationships of perceptual abilities?		3	2	
4.	Inservice provided adequate definitions of auditory closure and auditory figure-ground abilities and disabilities?	1	4		
5.	Inservice provided an understanding of rehabilitative techniques of verbal rehearsal, mediation, visual cues, etc.?	1	4		
6.	Inservice provided understanding of prosodical methods of instruction in verbal mediation?		3	1	1
7.	Inservice allotted adequate time to learn verbal rehearsal, mediation, prosody, visual cues importance, etc.?		3	2	
8.	Inservice provided "hands-on" experience using verbal mediation techniques?	1	2	2	1

	4	3	2	1
9. Inservice provided methods, ideas, suggestions to alleviate auditory figure-ground disability and which could be applied to other daily activities?	2	1	2	
10. Inservice provided list of classroom management suggestions to alleviate auditory figure-ground disability	2	1		2

Part II. Please answer the following questions regarding the target students in your classroom:

Scoring:	Significant (4)	Moderate (3)	Slight (2)	None (1)
	4	3	2	1
11. Change in student's attentive behavior, i.e., less distractibility, restlessness, confusion, etc., as judged by teacher's opinion.			2	1
12. Actual change in children's ability to follow directions and/or comprehend as shown by paperwork?		3		
13. Change in number of tasks accomplished by the children as shown by teacher's records?		1	2	
14. Change in understanding of temporal sequencing, i.e., first, last, before, after, etc., as shown by teacher's records?		2	1	
15. Change in understanding of spatial concepts as shown by teacher's records?		2	1	

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Part III. Please indicate your opinion of the following questions.

	Yes	No	No Opinion
16. Did the inservice provide useful and needed knowledge of this problem?	(2)	()	(3)
17. Would you recommend this inservice be offered to other teachers?	(3)	()	(2)
18. Would you utilize the method of verbal mediation in your classroom in the future?	(5)	()	()

Thank you.

APPENDIX K
TESTS AND MATERIALS

TESTS AND MATERIALS

Boehm Test of Basic Concepts (BTBC)
 Psychological Corporation
 New York, New York
 (Price unknown)

Developmental Learning Materials
 1 DLM Park
 P.O. Box 4000
 Allen, Texas 75002
 Auditory Imagery Tapes (Level I, II, III) \$60.00
 Auditory Memory Tapes (Level I, II, III) \$89.50

Ideal School Supply Company
 Oak Lawn, Illinois 60453
 Auditory Closure Cards \$6.75

Illinois Test of Psycholinguistic Abilities (ITPA)
 University of Illinois Press
 54 East Gregory Drive
 P.O. Box 5081
 Sta. A
 Champagne, Illinois 61820
 Complete test battery \$110.00

Peabody Picture Vocabulary Test-Revised (PPVT-R)
 American Guidance Service
 Circle Pines, Minnesota 55014
 Form 1 \$31.00

Woodcock-Johnson Psycho-Educational Battery (WJPEB)
 Teaching Resources Corporation
 50 Pond Park Road
 Hingham, Massachusetts 02043
 Complete test battery \$125.00